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TULSA, OKLAHOMA - DECEMBER 22, 1927

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Extending Agreement Aids Situation

Highest daily average estimated production in 1926, week ended Dec. 25, 2,385,139 bbls. Lowest in 1926, January 30, 1,915,960 bbls.

Curtailment Plan at Seminole Postpones Possible New Flood of Oil Until June. West Texas Offsets Decline

By Andrew M. Rowley

Highest daily average estimated light oil production in 1926, week ended Dec. 25, 1,797,349 bbls. Lowest in 1926, Jan. 30, 1,371,600 bbls.

The decision to continue until March 1 the drilling curtailment plan in sections of the Greater Seminole area in Oklahoma where wells already drilled indicate new pools are located will have a most important influence on the general situation in Oklahoma and Kansas and, naturally, will have an effect upon conditions in other areas. A steady improvement may be expected in Oklahoma and Kansas with the continued decline in production from the Seminole area. Realization that such improvement will be experienced probably is the reason for considerable talk regarding higher crude oil prices, but there is very little basis at this time to warrant any change in the crude oil price structure.

The decline at Seminole is being offset by increases in West Texas and it is more than likely in the comparatively near future gains in West Texas will be greater than decreases in Seminole. The low prices prevailing for West Texas crude will exert an influence on the crude oil price structures in other areas regardless of the difference in the qualities of the crudes. It must be kept in mind West Texas crude is being refined and the pipe line activity in that section indicates considerably more of this production will be available to markets soon. Any unwarranted spread in prices between West Texas crude and the product of other fields would be felt immediately in a greater demand for the lower priced oil.

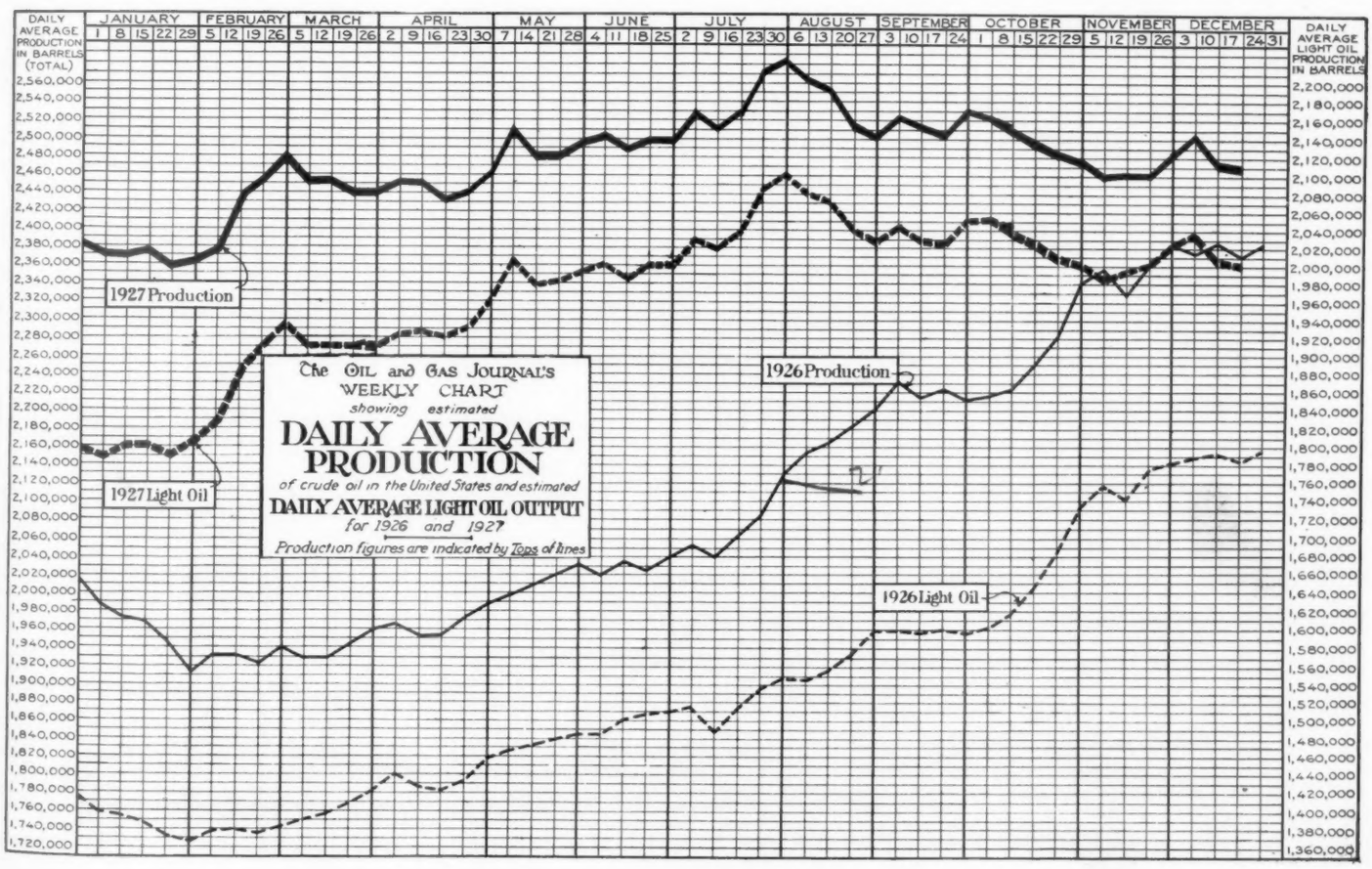
It will require at least three months to drill up the five places in the Seminole area where discovery wells now are pinched or shut in under the curtailment plan. That means, if the agreement is enforced until March 1, these potential pools will not make themselves felt in the production column until sometime next June. Consequently, it is easy to visualize the importance to the general situation of the success of operators at Seminole to postpone at least the menace of another flood of oil.

PRODUCTION IN THE UNITED STATES

Estimated daily average production of light and heavy gravity oil in the United States for week ended December 17, and a comparison with the previous week follows:

	Dec. 17		Dec. 10	
	Light	Heavy	Light	Heavy
Oklahoma—				
Tonkawa	15,565	.....	16,335	.....
Burbank	36,815	.....	37,315	.....
Other Osage Fields	29,835	.....	30,020	.....
Cushing and Shamrock	21,020	.....	20,915	.....
Bristow and Eastern Bristow	24,610	.....	24,840	.....
Cromwell	10,735	.....	10,730	.....
Garber	10,005	.....	9,815	.....
Blackwell-Braman	8,610	.....	8,770	.....
Seminole	381,070	.....	395,510	.....
Wewoka	10,370	.....	10,170	.....
Northern Miscellaneous	111,075	.....	111,115	.....
Southern Fields	60,685	.....	60,595	.....
Total Oklahoma	720,395	.....	736,130	.....
North Louisiana	38,705	8,520	39,130	8,490
Arkansas	22,780	72,465	22,775	73,345
North Central Texas	135,703	.....	136,747	.....
West Texas	271,619	.....	255,642	.....
Texas Panhandle	83,210	.....	86,360	.....
East Central Texas	27,942	.....	28,317	.....
Kansas	105,410	.....	106,180	.....
Total Mid-Continent Area	1,405,764	80,985	1,411,281	81,835
Gulf Coast	.....	144,908	.....	143,400
Southwest Texas	.....	25,846	.....	25,865
Eastern	113,000	.....	113,000	.....
Rocky Mountain Area	79,885	.....	74,440	.....
California—				
Santa Fe Springs	38,000	.....	39,000	.....
Long Beach	113,000	.....	112,500	.....
Torrance	3,000	17,000	3,000	17,000
Huntington Beach	60,000	.....	61,000	.....
Dominguez	13,750	.....	14,000	.....
Rosecrans	9,250	.....	9,250	.....
Inglewood	19,500	12,000	20,000	12,000
Ventura Avenue	54,000	.....	52,500	.....
Seal Beach	45,000	.....	46,000	.....
Remainder of State	54,000	186,000	55,000	186,000
Total California	409,500	215,000	412,250	215,000
Total United States	2,008,149	466,739	2,010,971	466,100
Grand Total	2,474,888		2,477,071	

Total Decrease, 2,183 Bbls.; Light Oil Decrease, 2,822 Bbls.



No Improvement in Refining Market

Oklahoma Prices at Lowest Level of Year. Natural Gasolines Experience Greatest Decline During Past Week

By W. T. Ziegenhain

According to the present prices and trends, the general Oklahoma refined oil market will close the year at the lowest level seen in many years and there is little promise of a betterment immediately next year. Refiners have expected an improvement in prices as the Seminole crude oil production showed a definite decline and then thought general conditions would improve as the year closed, but instead, they are now forced to take less for their products in general than at any time during the year.

Gasoline has been noticeably soft over the week. It was freely offered at prices under 6 cents, particularly in the Chicago district in meeting the competition from that and other refining centers. If one grade could be said to be stronger than another, that position would be left to 60-62 400 endpoint gasoline.

Naturals Weaker

Natural gasolines displayed a similar weakness as all grades were quoted at lower prices. The continued increase in production, coupled with a slow movement of the material to refineries, has forced the smaller manufacturers into the market, offering concessions to enable them to move it readily. There was comparatively little export buying to relieve this condition and it is apparent this is the only factor which could stabilize the market over the next few weeks.

Opinions vary regarding the present kerosene market. Some refiners find it difficult to move their material at the general market prices while others report getting the top price for their production. The wide difference in quality accounts for this discrepancy in most cases however.

Distillates moved more readily and it might be said these shipments have finally settled down to the volume to be expected during the winter season. The light grades of furnace distillates were favored in this trading and some refiners advanced their prices slightly. These same refiners report the volume of these shipments represented a substantial share of the total light oils being moved.

Gas oils were held at last week's prices but there was very little trading. Some of the large stocks of gas oil accumulated during the earlier months of this year were being blended with the lower gravity fuels to make the higher gravity fuels but the total volume of these was not great. Fuel oils remained plentiful at last week's market prices with only a fair amount being moved.

Sales managers were attributing the slow demand for lubricants to the seasonal decline in consumption. Bright stock was again the weakest product in the list of lubricants. Although its general price range was no lower, there was some moved for export bearing a substantial price concession. Wax prices showed no change as reports from the Atlantic Coast ports intimated a stronger export market but these were not followed by orders from this territory.

Future Situation

Refiners are now probably less decided in regard to the future of refined oil prices than at any time during the year. There are some who point to the possibility of another crude cut after the first of the year, due to the present refined oil prices forcing many refiners to curtail production or shut down entirely. This will back up the crude on to the producer who is not willing or able to carry a higher inventory of stocks. On the other hand, Seminole crude production is show-

(Continued on Page 140)

REFINED MARKET BAROMETER

The general refined oil market remained unchanged in all refining centers except in the Mid-Continent, where added weakness developed in refinery and natural gasolines. Kerosene was stronger in the East and in California but remained weak in other sections. Gas oil continued strong along the Atlantic, as an increasing volume of it is being used in the artificial gas plants, and the demand for Diesel oils is maintained. Fuel oils were generally unchanged. Furnace oils were in greater demand in the Mid-Continent, but warm weather in the East delayed activity in that market. Lubricants were moving slowly, but improved conditions along the Gulf, due to a curtailment of refinery operations coupled with the increased winter demand for zero cold test lubs, has given prices greater stability. Wax was plentiful, as only a normal amount was moved for export.

Mid-Continent—Gasoline moved slowly at lower prices. Natural gasolines registered a like decline as excess material was offered freely. Kerosene, gas oil and fuel oils were weak, but no price changes followed. Lubricants moved slow as a result of seasonal decline in consumption. Wax remained unchanged.

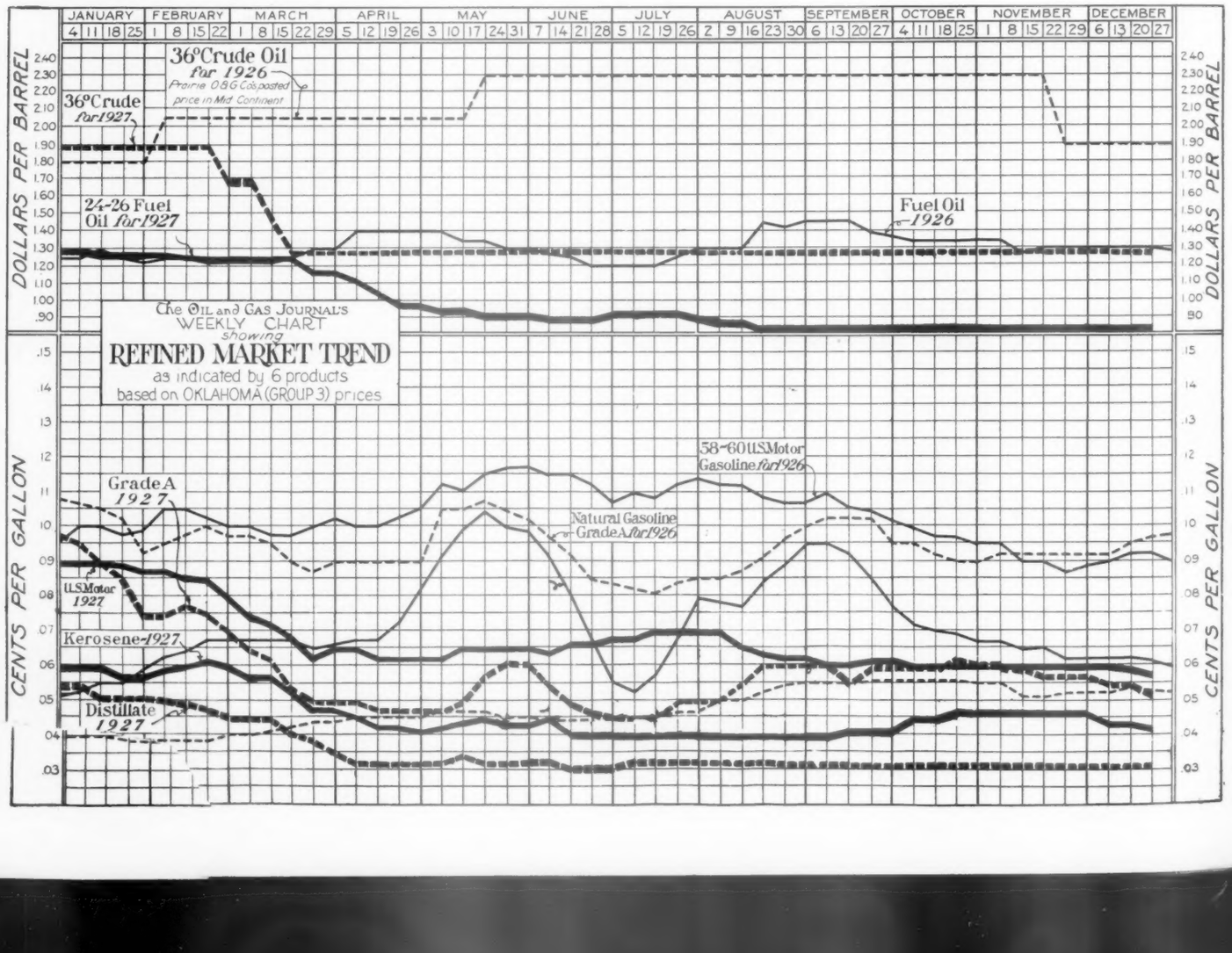
Atlantic Seaboard—Warm weather occasioned a high gasoline consumption, allowing prices to remain at last week's level. Several trainloads of Mid-Continent gasoline were unloaded at New Jersey and Pennsylvania points, but were readily absorbed. Fuel oil continued weak. The increased consumption of gas oil by artificial gas plants made that market strong. Lubs and wax remained unchanged.

Pennsylvania—Gasoline continued to move slowly as kerosene strengthened slightly. Lubs and wax were unchanged.

Chicago—Increased demand for furnace oil and low cold test gas oils featured the market. Gasoline consumption continued fair, although prices were weakened as material was freely offered from many points. Fuel oils improved their position as a result of the cold weather.

Gulf Coast—Firmer lub prices resulted from the increased demand for zero cold test oils. Other products remained unchanged as conditions were generally favorable to slight advances.

California—Gasoline remained fairly strong as the domestic and export movement continued good. No change was made in the other products.



Sinclair to Loop Healdton-Mexia Line

Will Permit Company to Increase Shipping Facilities From Oklahoma. Other Companies Active in West Texas

By James H. Dameron

FORT WORTH, Tex., Dec. 19.—Decision of the Sinclair Pipe Line Co. to loop its 8-inch line from Healdton, Okla., to Mexia, Tex., with another 8-inch line was the most talked of development among pipe liners in Texas during the past few days.

It has been generally rumored that the Sinclair company was considering building a pipe line system into West Texas and that a meeting of officials would be held in Tulsa to consider the proposal. A meeting of Sinclair officials was recently held in Tulsa and the announcement of plans to loop the Mexia line followed that meeting, and from the executive offices of the company in Tulsa comes the positive announcement that the company has no intention of building a line to West Texas at this time, and that the linking of the Mexia-Healdton link is necessary for current operation of its Oklahoma to Gulf line.

North from Healdton the Sinclair company's line capacity is around 30,000 bbls. daily. South from Healdton to Graford station in northeastern Palo Pinto County the 8-inch line has a capacity of 18,000 bbls. daily. The main line on south from Graford to Mexia is of similar size and capacity and the 8-inch system west from Graford to Ranger has a capacity of 18,000 bbls. daily.

Loop Relieves South End

From Healdton north or from Mexia south the pipe line company can handle 30,000 bbls. daily but between Mexia and Healdton only 18,000 bbls. daily can be pumped. The new line will increase this to 30,000 bbls. Sinclair company has a 35,000-bbl. capacity refinery on the Houston ship channel and loading docks there for crude shipments to the Atlantic seaboard. Pressed for crude to supply demands south of Mexia the company has found it necessary to draw on storage at Mexia. That storage, according to reports, has been reduced to a point where the supply will last only a few months more at the present rate of withdrawal. The 160-mile loop will relieve this situation by enabling the company to increase its shipping facilities from the Oklahoma fields southward to 30,000 bbls. a day.

In West Texas pipe line construction continues to move along briskly despite the reversals expected with a succession of cold waves.

Atlantic company has completed around 30 miles of its 70-mile welded 10-inch line running east from the Hendricks Field in Winkler County to Midland. It is expected that line will be completed around the first of the year.

Humble Pipe Line Co.'s extension into Hendricks has been changed slightly from the last reports. That company is building an 8-inch carrier from Hendricks south to Monahans on the Texas and Pacific railroad. The line will be built on southeast to connect with the company's system running into the Church and Fields Pool.

A loading rack will be built at Monahans and crude shipped from there until the 8-inch system is connected with the main line system at Church and Fields. The line will have a capacity of between 18,000 and 20,000 bbls. daily.

Shell Line to Loading Rack

Shell Pipe Line Corp. has completed a 6-inch line from Hendricks south to the T. & P. railroad and has finished construction work on a 30-car loading rack. The company is shipping around 6,000 bbls. daily from that loading rack via tank cars to East Chicago, Ill. Due to traffic congestion on the railroad the pipe line company can get only 30 cars spotted daily. The company is in a position to handle 12,000 bbls. daily out of Winkler and is reported considering paralleling the 6-inch line with another.

Shell Corp. proposed to build a 10-inch trunk line from Hendricks to Healdton, Okla. That system, in the event it is built, would have a 6-inch system feeding it from fields in Crane, Upton and Pecos Counties.

In addition to the foregoing concerning the Humble Pipe Line Co.'s construction work out of Hendricks, the same company is looping its double 8-inch line from Kemper station east to San Angelo to increase that system's line capacity. The double 8-inch line runs east to Comyn where it ties into the Humble's main line system to the coast from North Texas.

Illinois Pipe Line Co.'s plans to boost its line capacity out of the Yates Pool in Pecos County to the pipe line company's 2,000,000-bbl. tank farm at Del Rio, are nearing completion.

Roxana Corp. is laying a 6-inch line from the Yates Pool to McCamey in Upton County. That company is building a tank farm near McCamey. Gulf Pipe Line Co.'s 8-inch line from Yates to a loading rack in McCamey has been finished and oil is being run through it.

Texas Pipe Line Co. is reported to have ordered equipment and pipe to build a 28-mile 8-inch line from Hendricks to Monahans. A 35-car loading rack is to be built at the terminal of that line. The Texas Company recently bought out the Pure Oil Co.'s holdings in West Texas and the proposed Pure company's line from Hendricks to Wickett and the plans for a loading rack at Wickett have been abandoned.

Monahans Selected

Monahans was selected in preference to Wickett because of the proposal of the Texas and New Mexico railroad company to build a road out of Monahans to a point on the Santa Fe in New Mexico. Monahans is on the Texas and Pacific road as is Wickett but the increasing tank car shipments over that road and the increasing movement of oil field freight has caused a traffic congestion. The road north from Monahans is still in the proposed stage.

The Ocean Pipe Line Co. is almost ready to run oil through its 4-inch line from Hendricks to Pyote. The pipe line company is building two 10,000-bbl. capacity storage tanks on the Turman and Maxwell lease in Hendricks and is buying the lease's production.

Blue Bonnett Refining Co. is planning to build a 3,000-bbl. topping plant on the T. & P. railroad 1 mile west of Wickett and the plant will operate on Hendricks Pool crude. It is reported the Southern Pipe Line Co. will run the oil to the topping plant. When construction work on the refinery will start was not learned.

Independent Oil & Gas Co. has started construction work on its 8-inch welded line from Hendricks south to the T. & P. railroad where a 75-car steel rack is to be built. That company reecntly made a contract to deliver 15,000 bbls. daily to the New Orleans Refining Co. The contract will expire next April 1 and the construction will be hurried through.

At present around 30,000 bbls. daily is being run out of Hendricks by the Southern Pipe Line Co. and American Petroleum Co. The former is running around 14,000 bbls. daily and the latter around 16,000. During the month of November the Southern company ran 195,924 bbls. through its terminals of lines out of Hendricks. The total tank car shipments out of West Texas during the last month amounted to 687,922 bbls. The preponderant bulk of that crude came from Upton County and Winkler County. The crude stocks in West Texas totaled 11,725,000 bbls.

Repressuring and Treatment of Oil

Valuable Papers on These Subjects Read Before Mid-Continent Section of A. I. M. E. at Tulsa Meeting

By J. L. Dwyer

The reading of a paper on repressuring oil sands, and a talk on treating oil were accompanied by an interesting discussion of various phases of oil production at a meeting of the Mid-Continent section of the American Institute of Mining and Metallurgical Engineers held in Tulsa, Okla., on Monday of this week. A. W. Ambrose, chairman of the section, presided.

The paper on repressuring was read by F. B. Hall, petroleum engineer of the Tidal Oil Co., while the talk on modern treating practices was made by J. R. McWilliams, petroleum engineer of the Skelly Oil Co.

Mr. Hall's paper, which is very comprehensive, drew the remark from a prominent engineer present that each of his sub-titles was worthy of a full paper. The Tidal Co. has been one of the most successful in the restoration of pressure to old sands, particularly in the shallow fields of northern Oklahoma.

Mr. McWilliams made his talk from notes, and gave a very well prepared address upon the case of a Skelly lease in central Oklahoma. His talk was illustrated by the picture and graph shown with this article.

The lease under discussion by Mr. McWilliams is located in township 14-8 Creek County, Oklahoma where the Skelly Oil Co. found it necessary to treat some oil which was produced from the Dutcher sand. The treating also had a pronounced effect upon the gravity of the oil.

Treating Practice

The normal gravity of the oil on this lease was 40 degrees A. P. I. and it had a color which closely corresponded to the color of Wilcox oil. After a study of the individual problems of the lease, Mr. McWilliams planned the construction of the equipment shown. The topography of the lease shows a ravine running down the center, flanked by two hills on either side. A set of specially constructed receiving tanks were placed upon the hill, and the boiler which conveyed the heat to the oil was located in the ravine.

The oil was produced from 10 wells by means of an ordinary pumping arrangement, and was then introduced into the boiler where a temperature of 120 degrees was maintained. An unusual feature of the boiler arrangement is that it is mechanically controlled instead of being hand controlled like the ordinary treating boiler. In considering this arrangement it was Mr. McWilliams' thought to eliminate so far as possible, the human element of tendency for error, and for this reason the thermostatic control was installed at the boiler. The mechanical control is believed to be of exceptional value when cold winter nights are considered, for with weather close to zero and a strong north wind, even the most conscientious of lease men is apt to stick close to the home fireside to the neglect of the boiler which he is supposed to watch. The result is that the oil invariably has received either too much temperature or too little, with the result that in one case, the gravity has not been benefited, and the treating of cut oil has not been accomplished, or else a considerable amount of oil has been burned by the application of too much heat. By means of the thermostatic control, the temperature at which the oil is treated is maintained constant at 120 degrees Fahrenheit.

The oil passes through the boiler and into the line to the receiving tanks above. The line conducting the oil is an insulated line, and it will be observed that it is carried on stilts instead of leaving the boiler and travelling along the ground to the tanks. This is for the purpose of eliminating the annoyance caused by the gases rising to the top of the line around the risers, and causing a certain degree of slippage.

One of the most important phases of this treating plant is that the oil is introduced into the tanks submerged, and, instead of the line having a riser which brings the oil into the top of the tank and allows it to splash into fluid within the tank, the oil is introduced completely submerged through a connection 2 feet from the bottom of the tank. By this means, the splashing is eliminated, and it is thought that this reduces loss in gravity.

The tanks are insulated welded tanks constructed specially to specifications drawn by Mr. McWilliams. From the first tank, the oil graviates over into two other tanks. In being conducted from the first tank, the oil is split into two streams, one going to each tank. By this method there is a lessened opportunity for additional gravity losses, and it also tends to eliminate any remote chance which the oil may still have to emulsify.

From the tanks the oil runs by gravity down the hill to a pair of cooling coils which reduce the temperature to atmospheric, and then into the stock tanks. The line which conducts the oil downhill is also elevated slightly above the ground in order that the wind may play its part in the cooling process; and will be permitted to exert its work on the bottom of the line as well as on the top.

Graph Shows Results

In this day when the gravity system of oil purchasing means much to the producers' income, the graph accompanying this story tells an important tale in dollars and cents. The graph is novel, and is divided into two parts. The bottom part of the graph illustrates the daily oil produced upon the lease in barrels. The top section of the graph shows the gravity of the oil produced. Each dot on the graph indicates one tank of oil which was run, i.e. on September 5, three tanks of oil were run from the lease, one tank at 40.7, one at 41 and one at 41.1 degrees A.P.I.

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Yates Pool Yield Most Economical

Acreage and Drilling Costs Low. Little Storage Required Under Proration Plan. Fishing Troubles Few

By C. D. Lockwood

FORT WORTH, Tex., Dec. 19.—"Looks like our No. 3 up on the 'X' lease is a 'bust.' She's only doing 75 bbls. an hour and she's down 1,340 feet."

Believe it or not, this disconsolate remark was actually overheard by the writer while on a visit to the Yates Pool of Pecos County last week, and it was spoken seriously. Tragedy. Only 75 bbls. an hour at a depth where 75 bbls. a day would, in most fields, be considered very satisfactory production. But that remark reveals a peculiar attitude of mind that has grown upon the men in the field down there. They are actually ashamed of any well which flows less than 100 bbls. an hour. Small wonder, though, since 55 producers in the pool gauged more than that amount when tested for proration purposes December 1 while only 13 fell below the century mark, and most of the unlucky 13 were either edge wells or were just being drilled into the pay and had not yet been completed.

It is easy to wax enthusiastic about the Yates Pool. Viewed from the top of the "mountain" as they call the high ridge running through the field, it presents a mighty panorama that dazzles the imagination with its possibilities. Vast stretches of rugged hillsides and valleys have scarcely been touched by the drill. A small cluster of steel derricks here and there, a few machine masts sticking up like toothpicks in the distance, and between them hundreds of locations yet to be explored and yet all within definitely proven territory—such a picture defies the ordinary petroleum vocabulary. The terrain looks somewhat like that in the Panhandle but there the comparison ceases. Where the Panhandle outposts of production were stripper wells, the boundaries of the Yates Pool are marked by 10,000-bbl. gushers, and where the Panhandle producers had to spend $35,000 or more to reach the pay, the Yates Pool operators are called upon for $10,000 or less.

Most Economical Production

Many records have been claimed for this marvel of West Texas. On the basis of a 1-hour gauge, enthusiasts have proclaimed the Yates Pool greater than Seminole in her palmiest days. Pecos County's most celebrated well, Mid-Kansas & Transcontinental's No. 2 Yates-C, has likewise been heralded as the greatest producer of shallow depth in the United States. Regardless of the merit of these assertions, however, this writer wishes to advance a more important claim.

The Yates Pool is yielding the most economically produced oil in the United States. Maybe that goes for the world, too, and possibly it applies to all time as well as the present.

In the first place, nearly all of the acreage was acquired for a song, something like $1 or $1.50, and much of it for less. Drilling costs to the shallow pay are ridiculously low, even considering the fact that expensive roads have to be built to many locations. Under the pipe line proration plan practically all of the oil now being produced is run from the field so that an expensive storage building campaign has been averted. Only 16 large steel tanks have been built or started in the field, even including the reservoirs at the two main pipe line pump stations. And lastly, after the wells have been put on production, they cost less for maintenance, considering their output, than anywhere else in the world, so far as this writer knows. Lifting costs just simply "ain't."

Few Fishing Jobs

No clean-out string has ever been run in the Yates Pool. Nobody has ever had a fire—as yet—and there have been very few fishing jobs. They turn those big wells on and off like water, in many cases pinching them by the cracking of a valve, level off the cellar so that nothing remains but a greasy spot on the side of the hill and a small control head sticking up a few inches above the ground, then practically forget all about it except to put on a larger or smaller choke as the proration quota fluctuates. In the meantime, this well, treated so coldly and impersonally, may be flowing 1,000 to 3,000 bbls. daily under its restraint. Two men to a tour, or four in all, on wages of about $150 each, handle as many as six or seven of these producing wells where they are grouped close together on one lease.

This Yates Pool, however, is unique in many ways other than its usual production from such shallow depths. It is the quietest and most businesslike field of its size and potentiality that this writer has even seen. Approximately 80 wells are now flowing from 40,000 to 50,000 bbls. daily and could make 250,000 or 300,000 bbls., the proven area already more than 6 miles long, embraces 15,000 acres, and upwards of 60 strings of tools are running but the old-time "boom" spirit is lacking. Compared to Borger, Seminole and other well known pioneer towns of the oil fields, Iraan is a sleepy little country village, and the camps of the big companies are, on the whole, models of orderliness and comfort. The usual run of riff-raff, camp followers, that ordinarily infest a new field in its early days seem to have more or less neglected the Yates Pool. A new town by the name of Grube (if four or five frame buildings can be called a town) sprang up recently across the Pecos River in Crockett County and was promptly raided by state rangers almost before it got started.

Dust Stops Cars

Iraan's chief claim for distinction, as far as could be discerned from a casual survey, is its dust. It is undoubtedly the dustiest town of its size in the United States. Swirling clouds of dust almost obscure it from view at times when several cars and trucks get together on its main street and start plowing through. This dust, too, is so fine that it will stop a car much the same as if you were driving through a stream of water. In that case, the driver has to get out and wipe off the distributor, then try to get the hood down and get started again before another car comes along.

But Iraan may have a future. It was named for Ira Yates and Ann, his wife. Mr. Yates believes that Pecos County is too big to be governed from one point and foresees the day when a county seat will be established somewhere along the river in the district that now boasts a majority of the county's population. With a view toward Iraan's future he has set aside one block for a public square.

Down at one end of Main Street is a contribution to the social life labeled "Club Iraan," which, as stated on the door, is for "Members Only." Not having been invited to join the select circle, I could only guess at the club life enjoyed within. I was told, however, that the entrance requirements are $1 or its equivalent and that each new member is presented with 10 pool checks, which seems fair exchange.

Iraan already has electric lights, the current being supplied by a power line of the West Texas Utilities Co., which was just recently completed into the Yates Pool. All of the big company camps have electricity, too, and quite a number of the wells are now being drilled with electric motors. Such is the industrial development of Pecos County where, little more than a year ago, a painted building was such a novelty that a structure on the ranch of Ira Yates was known for dozens of miles around the country as the "Red Barn."

"Field Without a Derrick"

Driving along the 28-mile road to the field from Rankin, the nearest town on the Orient Railway, you would probably be surprised at another evidencee of the lack of excitement attending the development of the Yates Pool. You would pass a few scouts (or, rather, they would pass you) and a number of other cars with occupants apparently on urgent business but you would encounter very few trucks hauling equipment such as a pool the size of Yates would ordinarily need. The negligible amount of trucking on this road, of course, is due to the fact that wells in the Yates Pool require only a fraction of the equipment necessary in holes of 3,000-foot or greater depths.

It has been called the "Field Without a Derrick." Like the report of Mark Twain's death, this statement is somewhat exaggerated. Most of the operating companies, it is true, use drilling machines although the California Co. and the Marland Oil Co. use steel derricks exclusively and the Gulf Production Co. has a wooden rig on one of its Smith lease locations, the only wooden rig in the field.

About three years ago, in an article on the Big Lake Field of Reagan County, the writer referred to it as a "Wildcatter's Dream." The Yates Pool is perhaps even more worthy of that title but it can also be aptly dubbed the "Supply Man's Nightmare." On the majority of wells the equipment needed is almost pitiful. A few replacements for the machine now and then, a new wire line (only a 1,500-foot line at that), two or three short strings of pipe, a control head and fittings, a separator and some flow tanks—and that about sums up the equipment requirements. Only one supply company and one fishing tool outfit have taken the trouble to establish stores at Iraan, the only town in the field. Nearly all of the big supply companies have stores in McCamey, however, but that is about 45 miles away.

Drilling Difficulties

The chief drilling difficulties in this field are encountered within the first 300 feet. Especially on the sides of the hills, where locations have to be blasted out of the rock, the formations seem to be tilted so that crooked holes are a source of trouble. The use of a twisted bit, on the order of a spiral bit, and made a little larger in diameter than the regular tool so that it will fit the hole tightly, has been employed successfully by the Mid-Kansas Oil & Gas Co. in such cases.

The next source of trouble in drilling to the regular 1,000-foot pay is the oil which is found at shallower depths. It is apt to be found at almost any depth below 500 feet and all of it can't be cased off.

In spite of these difficulties, however, few fishing jobs have retarded the development, and some wells have been drilled in remarkably short time. Mid-Kansas & Continental's No. 7 Yates-C was completed in 14 days and I was told that another well was put down in 12 days although I couldn't learn the number.

Inaccessibility of certain locations has retarded drilling more than anything else

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MONTANA CHAPTER, ROCKY MOUNTAIN OIL AND GAS ASSOCIATION, MEETS

GREAT FALLS, Mont., Dec. 17.—The annual meeting of the Rocky Mountain Oil & Gas association, Montana Chapter, was held here the past week, with about 300 delegates present. Governor Erickson of Montana was the first speaker after the welcoming address by W. R. Strain president of the Chamber of Commerce. The governor stressed the need of legislation to handle the new problems confronting the state in regard to oil matters and strongly invited the oil men themselves to assist in this phase in order that a clear conception could be had by both the legislature and the oil opertaors.

Seek Legislation

In adopting the resolutions committee report, signed by LaRue Smith as chairman, the chapter continued its legislative policy of seeking adjustment of taxation matters affecting the industry. It is provided that a committee be appointed to present to the next convention a legislative plan for amendments to chapter 140 of the 1927 session laws relating to the taxation of royalties, it being contended that, although progress has been made, there is still inequality as to the payment of royalty taxes by producers as relates to the royalty owners. Such proposed legislation, after adoption by the convention at its next annual meeting to be delivered to a special legislative committee for presentation to the state legislature in January, 1928.

Discusses Royalties

Taking up the royalties tax the resolution says:

"While we most emphatically reaffirm the doctrine that no part of the proceeds of oil yielded to royalty holders, should be assessed to or taxed against the producer, and resolve strenuously to oppose any effort to burden the producer with such unfair tax, still we urge upon the consideration of the tax officials, our state officials and the state legislature, the necessity of a revision of the law in the interest of relieving the royalty holder from what has resulted in and appears to be an unfair burden of taxation for him.

"We dislike that portion of chapter 140 which makes the operator and producer jointly and severally liable with the royalty holder for the tax upon royalty oil.

"It is our conviction that the interests of the royalty holder, and of the operator and producer, are common; that the royalty holder can best promote his interests by encouraging and assisting the operator and producer, to whose efforts are largely due the values which royalties acquire; and that there should be no conflict of interest between these two groups of persons interested in the oil business. To this end, we urge upon all royalty holders the advisability of becoming members of our organization in order that they can be fully and adequately represented in our councils, and in the preparation and shaping of such legislation as this association may present in the interest of the industry, justice and fairness.

"We believe that the oil and gas as-

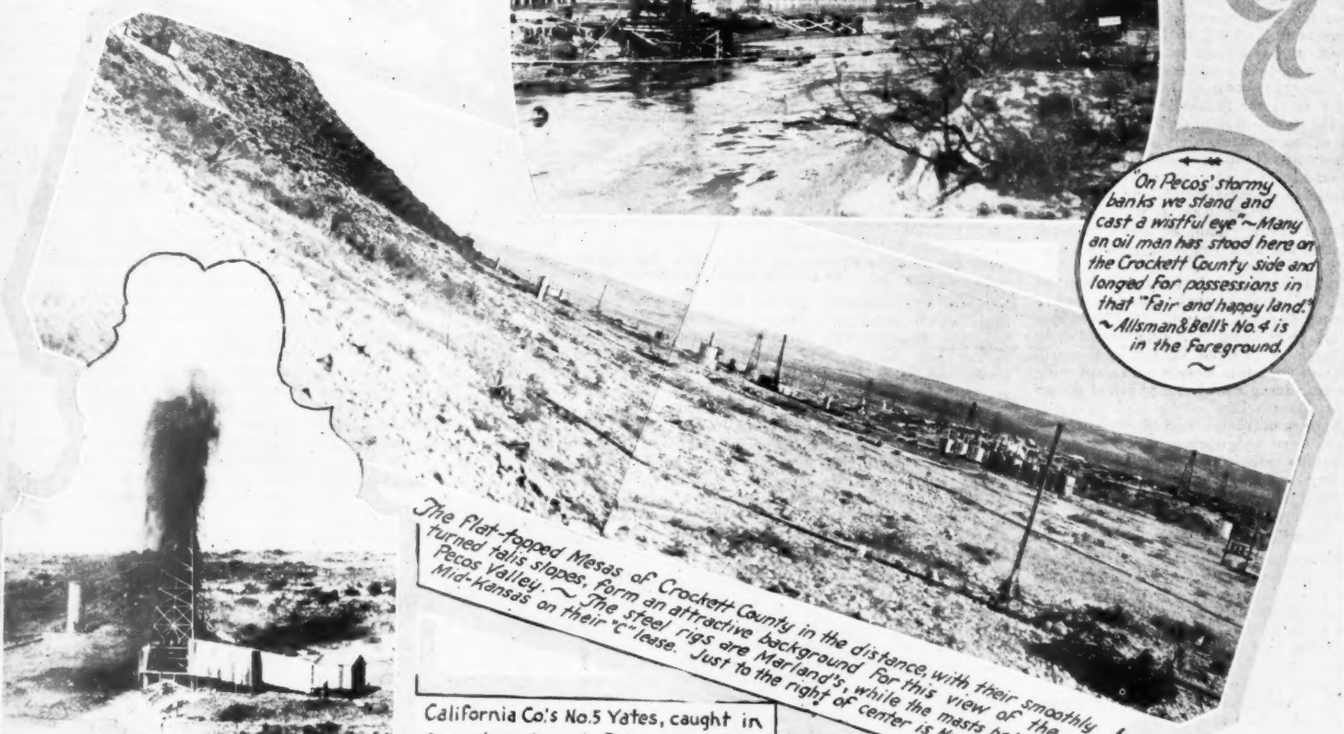
(Continued on Page 138)

Beyond the Pecos

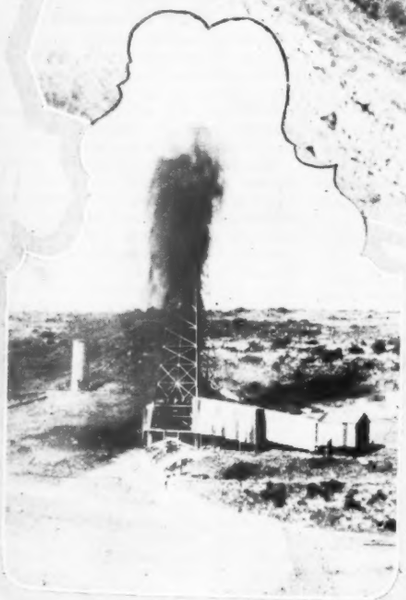
Puzzle: Find the 5,000-bbl. well. The greasy spot up on the hill near the center of the picture marks Mid-Kansas & Transcontinental's No. 3 Smith-Taylor, which flowed 227 bbls. per hour. No. 7 Yates-A is on the left.

This old machine has never drilled a dry hole according to the contractor who owns it. Maybe he is a little superstitious because it still stands beside its last offspring, Mid-Kansas No. 6-A, once the "Wonder Well" of the pool and still a gusher. ~

B. C. Clardy, tells them how much they can run each day. He is umpire in charge of proration.



"On Pecos' stormy banks we stand and cast a wistful eye" ~ Many an oil man has stood here on the Crockett County side and longed for possessions in that "Fair and happy land." ~ Allsman & Bell's No. 4 is in the Foreground. ~



The Flat-topped Mesas of Crockett County in the distance with their smoothly turned talis slopes, form an attractive background for this view of the Pecos Valley. ~ The steel rigs are Marland's, while the masts belong to Mid-Kansas on their "C" lease. Just to the right of center is No. 8-C Yates.

California Co.'s No. 5 Yates, caught in an exuberant mood. This well gauged 963 bbls. per hour. The flow isn't much higher than an ordinary well, however, because of the small amount of gas.

C. D. Lockwood

Promoting Health in New Oil Fields

Program in Seminole for Removal of Unhygienic Conditions Likely to Reduce Menace in Other Oil-Boom Towns

By Thomas F. Smiley

Health conditions in oil-boom towns of the future may be expected to maintain a higher level as a result of an active program that is being developed in the Seminole Field under the direction of the Oklahoma State Health Department. Civic organizations, local doctors and the school system are co-operating in the execution of this program, which has the approval of oil companies operating in the field and which is likely to serve as a basis for similar movements in other gusher oil towns, where men and women flock in unrestrained hordes before adequate provision has been made for food, shelter and medical care.

While child life and motherhood are the direct concern of the program undertaken in the Seminole Field, the influence of its operation extends to adult life, with the results that matters of sanitation, hygiene and social morality are engaging a degree of attention never before accorded them by hundreds of those who make up the population of an oil town in its early period of excitement, congestion and stark disregard for laws governing human wellbeing.

Conditions attending the first feverish months of an oil-boom town are conducive in high degree to disease. Only those who actually have witnessed the scenes marking a typical oil rush can appreciate fully the terrific congestion that prevails.

Seminole City in the middle of July, 1926, was a village of 850, with nothing more portentous in its placid existence than a drilling well nearby. Drilling wells had become common sights. Six months later it was estimated that more than 40,000 persons were receiving mail —or making a frenzied effort to receive it—at the Seminole City postoffice. The Independent-Garland well had come in a gusher, and the boom was on. In passing it might be mentioned that some of the Christmas mail of 1926 was not delivered from the Seminole City postoffice till the next March, with the wearied post office working night and day.

Cleanliness, the first great prerequisite of health, was next to impossible, because cleanliness requires water, and there was no water. How was a water system designed for a village of 1,000 to meet the demands of a whirling, oil-mad camp of 40,000?

Crude sanitary devices, breeders of filth and disease, took the place of a modern disposal system. The pestilential fly contributed to a situation already bad enough. Women of the underworld streamed into this loosely organized community, adding moral and physical poison to its uncouth life.

There was illness and doctors of the region were overworked, but there was no serious outbreak of disease before cold weather set in, helping to check such maladies as had been fostered especially by heat and flies.

Working Hard Against Odds

The municipal authorities of Seminole City were working hard against immense odds to provide proper public utilities for a population that almost had doubled four times in about as many months.

Another summer came. Inside the corporate limits of Seminole City wonders had been accomplished. The water system had been enlarged. Streets were being paved. A sanitary sewer system was installed. But in the outlying fields, where thousands lived in frame shacks or in tents, without any proper sanitary provision and without protection from swarms of germ-carrying flies, conditions inimical to health, especially child health, prevailed on all sides. Major oil companies constructed hundreds of substantial frame houses for permanent employes. These were equipped with modern conveniences, but they could not counteract the results of unwholesome conditions in the rude, hastily established dwellings nearby.

Typhoid, inevitable concomitant of filth, appeared. It was recognized that the conditions were such as to threaten a serious epidemic and the State Health Department took a hand. Bacterial vaccine was provided and a clinic was established in the Seminole City Hall for its administration. Physicians also were provided with the vaccine and they cooperated in an earnest effort to head off an epidemic. In spite of all that could be done almost 500 cases of typhoid developed in the summer and fall of 1927.

Records kept by J. C. Chadwick, registrar of vital statistics for the Seminole area, which includes the Seminole City, Searight, Bowlegs and Little River districts, show that in July there were 21 births and 41 deaths (virtually twice as many deaths as births). August showed improvement, 21 births and 28 deaths being reported. In September the number of deaths reported was exactly twice the number of births, the figures being 19 births and 38 deaths. Incomplete figures for October showed marked improvement, and in November it was believed the threatened epidemic was well in hand, with evidence that before the arrival of another summer many of the conditions that were a menace to life would be removed.

Dr. Lucille Spire Blachly, assisted by Miss Flo Ann Mueller, conducting an examination at a Child Health Conference in Seminole area.

While declaring that the deaths in the Seminole area in the summer and fall of 1927 were largely from disease growing out of filth, Dr. T. G. Billington, of Seminole City, added that ignorance of the rudimentary laws of health contributed heavily to the mortality rate. He told of one case in which he was called to attend a maternity case and found the expectant mother in a tent, lying on a bed soaking wet with rain. Ordinary means of sterilizing instruments and gloves were absent in many of the crude homes to which he and other physicians were called. Notwithstanding such conditions, Doctor Billington commented upon the fact that he did not know of a case in either his own practice or that of other doctors in which death had resulted from infection.

Besides the toll exacted by unsanitary conditions and ignorance of hygienic rules, a tragic train of consequences follows the disordered moral life of the early oil field. Physicians of Seminole City report that in the short period since the discovery well was completed they have been called upon to treat more social diseases than in all their previous practice in the town. In one district of Seminole City, characterized by a name indicative of its character, women of the half-world ply their business under conditions that inevitably bring physical ruin to many of the men who go there, and then to wives and to children who must help pay the penalty of the father's misconduct.

The problem presented by this self-segregated district is the centuries old problem with which long-established cities have grappled with little success as well as the harried municipal officials of Seminole City.

Two-Thirds of Victims Are Children

Mr. Chadwick said that about two-thirds of the deaths reported throughout the summer and fall of 1927 were those of children.

Dr. Lucille Spire Blachly, director of the Bureau of Maternity and Infancy of the Oklahoma State Health Department, noting the alarmingly high death rate among infants and children under 6 years of age from the Seminole district, made a survey to investigate the cause, together with a study of means to remove it.

Two factors were outstanding in the conclusive report resulting from this survey. One was that more than three-fourths of these infant deaths were caused by diseases of dietary organs, and therefore preventable. The other was that with few exceptions no physician had been called in until the patient was in the last stages of illness. In view of these findings it was decided that an effort must be made to impress parents with the vital importance of prompt professional attention and with the inestimable value of preventive measures, such as typhoid inoculations, smallpox vaccinations and diphtheria immunizations. It was decided also to provide such definite, authoritative and scientific information on child health, particularly emphasizing nutrition and daily routine care, as could be applied in even the most humble home.

Miss Flo Ann Mueller, registered nurse on Doctor Blachly's staff, because of her special training in diseases of children and her previous experience in industrial centers in other parts of the country, was assigned to carry on the field activities of this project.

The school district is being used as a field unit for this work, a record card for the pre-school child being carried home by older brother or sister, to be filled out with data desired and returned to the nurse. With the card as a guide, Miss Mueller visits the home, where she is careful to avoid any appearance of "official investigation." Establishing a friendly footing, she is able to do much toward correcting unsanitary and unhygienic conditions besides obtaining information regarding families where there are no children of school age. She then is able to visit these other families and further spread her influence for better health.

"Mothers in general," said Miss Mueller, "are eager to talk, especially about their children, for whom they really want to do the best possible. Even when they are suspicious or indifferent they usually can be persuaded to see the point I'm trying to make by some little homely experience or some easily understood illustration. I find the people in the oil fields to be more limited in local neighborly acquaintance than I had supposed. Perhaps that is why they are particularly responsive to personal interest such as my visits imply."

A brief, simply written pamphlet, "Keeping the Baby Well," is left after these calls and the parents are invited to bring the children to the "Child Health Conference" held in the schoolhouse or some other building open for public use.

Other Women Help.

Teachers and women of the community help in these conferences, doing clerical work, weighing the children and providing transportation for those who have several children to bring long distances. The conference is available for all children under school age and is free.

The conference in reality is a complete survey of the child's condition. First the history is taken, his physical, mental and moral (habits and behavior) development being recorded. He is weighed and measured and a comparison with normal weight is made. If the subject is more than 10 per cent over or under weight, the fact is charted as a physical defect.

In the examining room Doctor Blachly, who makes special trips from Oklahoma City, the state capital, to do this work, goes over the child from crown to toe, pointing out to the parent such physical defects as she may find and not failing to comment on notably good qualities discovered.

After these findings are recorded on the history chart the parent is questioned and instructed relative to measures required for correction of defects and faulty nutrition. Definite diet lists, together with pamphlets on proper child care, are given. A duplicate copy of the history chart is given to the parent, with a recommendation that the child be taken to

(Continued on Page 137)

Production Practices at Seminole

Close Study Required to Determine Best Method of Keeping Wells Producing With Profitable Operation

By A. F. Hinton
Indian Territory Illuminating Oil Co.

Seminole production practice has now reached the stage at which close study is required if the best method of keeping the wells on production is to be determined. It goes without saying that the problem of keeping wells producing goes hand in hand with the question of making a profit from their operation. Solution of the problem naturally resolves itself into a determination of lifting costs by various methods; the principal difficulty lies in accurately determining these costs.

Use of the air-gas lift, which has been responsible for more than 70 per cent of Seminole's production, has brought about many changes in organization and accounting methods, or at least it has pointed out the necessity of such changes if this method is to become a component part of future development and production programs. Companies that have not made these changes now find themselves able only with difficulty and many approximations to state definitely just how they stand after 15 months operation at Seminole, and especially are they finding it difficult to state exactly how much it has cost them per barrel to lift the crude they have produced through gas-lift operations. The final problem, of course, is to determine when it becomes unprofitable longer to flow wells on lift, and the answer to this can be given only after considerable close study of conditions.

Four Methods Compared

There are only four generally used and recognized methods of obtaining production from oil wells: natural flow, pumping, swabbing and air-gas lift. Enough experience has been gained with the first three time-honored methods to enable one to state with some degree of accuracy how much oil and at what cost per barrel they will produce. As for the last named, the youngest, but, as far as Seminole is concerned, by far the greatest of them all, no such confident statements can be made. It undoubtedly got the oil, got it in large quantities, and got it quickly, but whether it has been a blessing or a curse to the industry is now the subject of much conjecture.

Had it not been for the gas lift, the Seminole district probably never would have reached 200,000 bbls. in daily production, as compared with its actual peak to 527,000 bbls. At its present age it probably would have been depleted 60 per cent, as against an estimated depletion of around 85 per cent for most properties in the older portions of the field. It is possible that more oil eventually would have been recovered from the field had gas-lift not been resorted to, but it would have been recovered over a much longer period and at very much higher cost. It is generally understood that Seminole was directly responsible for the severe reductions in Mid-Continent crude prices early this year, and it is altogether likely that these reductions would not have come to pass, or would have been less drastic, had Seminole never exceeded 200,000 bbls. a day.

Therefore, gas-lift is credited with recovering several years' production in one, at a low per-barrel figure, but at the same time it is charged with breaking the market and to a certain extent disorganizing the industry in the Mid-Continent Field. What many executives are now asking is this: "Would we not have been better off if we had taken Seminole crude out slowly, even though at higher cost, if by so doing we had maintained a comparatively high price for our product? The answer to that, of course, lies with the individual company, and can be determined only by actual analysis of its operations.

The chief difficulty in determining actual results of use of gas-lift lies in estimating what the wells would have produced by other methods, had these methods been applied to the wells early in their history. Many wells have been taken off gas-lift and put to pumping when they got down to the small production stage, while many others have similarly been swabbed when the companies decided that it was no longer profitable to operate them on lift. These wells, of course, have not performed in a manner at all comparable to what they would have done had they been put on the pump or swab immediately at the close of their natural flow period. In as much as practically all Seminole wells were put on lift as soon as they ceased flowing naturally, or immediately if they did not flow naturally, the only wells that have been pumped or swabbed have been those which either did not respond satisfactorily to gas-lift or which had declined to the point where it was not economical to flow them any longer.

One large company, in summing up for its executive results of its operations at Seminole, has made an interesting study of its gas-lift work, comparing it with other production methods. This company invested about a half-million dollars in compressors and general air-lift equipment. Its air-lift production was slightly more than 60 per cent of its total production from the district. In comparing air-gas lift with other methods of production, this company estimates that by swabbing and pumping one-half as much oil could have been produced as was obtained by lift. This is undoubtedly a conservative estimate, as it is probable that not more than one-third as much oil could have been produced by the other two methods. For the purpose of this statement, however, this company estimates that it got two years' ordinary production in one.

Operations Analyzed

Up to the date when this report was compiled, the company's lift operations had totaled 3,600 well flowing days. Analyzing each well's history in an effort to decide whether it would have been pumped or swabbed, and at what periods in its history these methods would have been used, the report estimates that there would have been 2,420 swabbing days and 1,178 pumping days on these wells. Its operations indicate that it cost $35 per well per day to produce with gas-lift, as compared with $75 a day for swabbing and $10 a day for pumping. On this basis, its gas-lift production was obtained at 4.4 cents a barrel, while use of the other two methods would have resulted in half as much oil recovered at a cost of 13.5 cents per barrel.

Another company permits the publication of the following figures as to the operation of one of its gas-lift plants. This plant, which has twenty-one 80-horsepower units, represents total investment of $276,000. It has had about nine wells connected, and during the four months from July to October, inclusive, has had 1,064 well flowing days. In that period the plant has produced 1,213,000 bbls. net, an average of 1,140 bbls. per well per day. Operation and maintenance of the plant (not including well operation charges) has totaled $14,600 in the four months, or about $3,650 per month. Charging the plant with interest on investment and with depreciation sufficient to write it off in two years, total charges, including operation and maintenance, have been $66,200. On this basis, cost of operation only has amounted to $13.75 per well per day and $62.20 per well per day, with all charges included.

Total lifting cost for this plant during the four-month period, with all charges included, has been 5.5 cents per barrel. Figuring only operation and maintenance charges, the oil has been brought to the surface for 1.2 cents per barrel. If we make the highly improbable assumption that the same amount of oil could have been swabbed from these wells during the same period, it would have cost $79,800 to produce it, at a lifting expense of 6.6 cents per barrel. It is probable that not more than one-half the amount of oil could have been recovered by swabbing or any other method.

Lifting Expense

It must be borne in mind that the foregoing figures on lifting expense apply only to actual gas-lift plant flowing expense, and they must not be considered as representing the cost of producing Seminole crude. They do not include direct lease expense, development expense, original cost of leaseholds, office overhead, or any item of expense outside of the plant under consideration.

During the past few months there has been a marked tendency on the part of Seminole producing companies, in the older portions of the field, to take the wells off lift and put them on the pump. This has been especially true in the Seminole City Field, oldest and most settled of the five fields. Some companies have selected certain walls for experimentation and have put them on the pump, while other similar wells have been equipped with tapered tubing and have been kept on gas-lift, the idea being to ascertain definitely which of the two methods is the better and more economical. Other companies have abandoned gas-lift altogether on many properties and are pumping all wells.

The general opinion among production men in the field seems to be that when a well gets down to around 200 bbls. daily it is time to take it off gas-lift, because it is costing too much to operate. This view is not generally shared by engineers, whose trend of mind and training lead them to a desire to be shown that the wells can be pumped as cheaply as they can be flowed, even on small production. The engineer's tendency is to continue to experiment with the wells until a way is found to keep them flowing profitably, while the production man believes in flowing them while the flowing is good and getting back to first principles as soon as he has convinced himself that they cannot be kept on gas-lift longer with profit.

Pumping Difficult

Pumping Seminole wells is fraught with difficulty simply because of mechanical troubles, and not because there is any strange or mysterious reasons why these wells should not pump as well as those in other fields throughout the Mid-Continent. Many of the wells pump quite successfully while they are pumping, but none of them is exempt from a great deal of down time, which causes them much lost production and add greatly to the final lifting expense. In analyzing a pumping well's performance, its down time and consequent loss of production must be taken into account if a true picture is to be obtained. When a pumping well is pumping, it undoubtedly lifts oil very cheaply as compared with any other method, but the difficulty at Seminole is to keep the beam in motion.

There are three principal factors that cause most of the pumping trouble at Seminole: namely, crooked holes, depth of the wells, and sand conditions, to give

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MISSISSIPPI OIL MEN AT MERIDIAN ORGANIZE STATE ASSOCIATION

By D. H. Bancroft

MERIDIAN, Miss., Dec. 17.—Mississippi has neither gas nor oil, save two small gas wells in Monroe County, but it has an abundance of oil seeps and geologists have accumulated considerable information in the past year which has encouraged the wildcatter and also drawn in several of the major companies. The same applies to Alabama, particularly the northwest corner of the state. Profiting by the experience of Louisiana and Arkansas, the youngest oil and gas producing states in this part of the Mid-Continent, those individuals and corporate interests attracted to Mississippi and Alabama by what has already been developed there have taken a leaf from the book and are preparing for the large-scale development honestly anticipated and definitiely indicated.

Whether this comes during the next few months or whether it is delayed for years, if the Mississippi Legislature heeds the demands of influential citizens of the state it will enact legislation to make the state an attractive field for the oil and gas industry's prospectors and developers. Just at present industry, of whatever line, is rather shy of Mississippi, but the business men of the state, the progressive, constructive element, is anxious to remove the cause of this attitude and substitute for it a standing invitation with a guarantee of fair treatment after the invitation is accepted. The incoming administration, it was stated at the meeting here Monday and Tuesday at which this desire was organized, has given assurance that it will support so far as possible the movement to open the state to industry, to outside capital, and the oil and gas industry in particular.

Businesslike Meetings

The meetings of December 12 and 13 were of the Mississippi Oil & Gas Association, formed at Amory shortly after the Amory Oil & Gas Co. brought in the first commercial well (gas) in the state. Developments and acquisition of more geological information, and past experience, plus a knowledge of existing discouragement to ou side capital, prompted the desire for a more definite and authoritative organization to go before the next Legislature with a weighty demand for remedial legislation. The result was the organization of the Mississippi-Alabama Oil & Gas Association, Alabama being taken in because, while it has advanced further than Mississippi, still has much of the same difficulties and barriers.

The constitution and by-laws of the Mid-Continent Oil & Gas Association were adopted in toto as those for the new organization which, it is believed, will eventually seek to become a unit of the Mid-Continent, and all of the most desirable provisions of the conservation laws, particularly as they apply to oil and gas, of the older producing states are embodied in a bill creating the Mississippi

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Propane and Butane to Enrich Gas

Carburetion of Water Gas When Mixed With These Gases in Various Proportions

By William W. Odell
Fuel Engineer, Bureau of Mines, Department of Commerce.

For a number of years there has been a very appreciable annual increase in the production and recovery of natural gas and natural-gas gasoline[1] in the United States, the latter product being used largely for blending with gasoline from petroleum in the production of motor fuel. On account of the increased amount of oil cracking in the production of gasoline and the accompanying increased percentage of low-boiling constituents in the resulting product, the specification for the natural gasoline suitable for blending have been altered, that is, the amounts of propane and butane which it can contain have been limited. The result has been that large quantities of the latter materials are wasted because there has been no ready market for them in large quantities. Because of this wastage and because it is probable that large quantities of these and similar materials will be produced in the near future as a result of the more general use of oil cracking processes, a study was made by the Bureau of Mines, under a co-operative agreement with the assistance of the Phillips Petroleum Co., of the suitability of these materials alone or in mixtures for use as gas enricher in the carburetion of water gas for city distribution.

This investigation included:

(a) A study of the properties of the low boiling members of the paraffin series including pentane with particular reference to their utilization as gases.

(b) Calculations of the compositions and properties of gases of various heating values made with water gas as a base using chiefly butane and propane-butane mixtures as enriching materials

(c) Consideration of the influence upon the numerous variable factors in the manufacture of carbureted gas of replacing gas oil (the present enriching material) by propane, butane or mixtures of the two.

(d) An estimate of the influence of such a change upon certain important items of cost in the manufacture and distribution of carbureted gas.

(e) And, subsequent to the foregoing, tests were made in a small gas plant, using as enricher, by carburization without cracking, a product comprising chiefly butane but containing small amounts of propane and pentane, entirely replacing gas oil. This product was furnished by the Phillips Petroleum Co., and is named by them "G. E. Gasoline" meaning gas-enricher gasoline. The influence upon the important factors relating to the use of this product for enriching water gas was noted and the lean gas as well as the carbureted gas made was tested.

Some Properties of G. E. Gasoline

(Propane, butane, and mixtures of the two.)

[1]Including casinghead gasoline.

These hydrocarbons belonging to the same chemical series as methane, having the general formula C_nH_{2n+2}, have many chemical properties in common with methane and their addition to a lean gas changes the properties and burning characteristics of the gas in the same general direction although to a different extent. The hydrocarbons of this series do not readily enter into chemical reaction with other substances and therefore are incapable of combining with oxygen or polymerizing in the distributing system and thus cannot cause gum and resin troubles commonly met with in the distribution of manufactured gas.

As the number of carbon atoms in the molecule increases, i.e., in proceeding from methane throughout the series, the oxygen requirements for the complete combustion of unit volume of the gases also increases; in other words, the calorific values of these hydrocarbons (as gases) increases from methane. Similarly the specific gravity increases from methane in the same order. In Table 1 are shown some of the psyical constants and properties of a few of these hydrocarbons which have bearing on their use for enriching gas.

It will be observed that both propane and butane are gases under normal conditions of temperature and pressure; accordingly it seems most feasible that they be stored under pressure and in the liquid form. Knowledge of the vapor pressures of these hydrocarbons at different temperatures is essential in making estimates relating to the feasibility of storing such products or the influence upon the cost of finished gas. Vapor pressure curves for some of the paraffin hydrocarbons are shown. Calculations have been made showing approximately the temperatures below which condensation would begin when these hydrocarbons are used as enricher in amounts varying from 2 to 12 per cent under pressure conditions varying up to 60 pounds and these data are shown in Table 2.

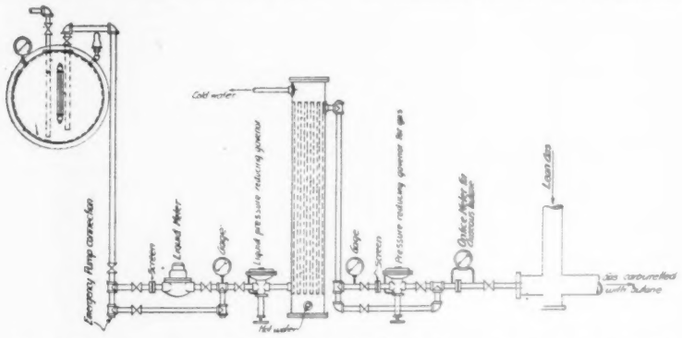

Fig. 1—Showing diagrammatically a means for using G. E. gasoline as enricher, similar to that used in the experiments at Muscatine.

Procedure

The calculations and preliminary study of the properties of these hydrocarbons indicated that they could be used satisfactorily for enriching lean gas and that the problem was chiefly a mechanical rather than a chemical problem. Means were developed for uniformly introducing the new enricher as a gas into the lean gas.

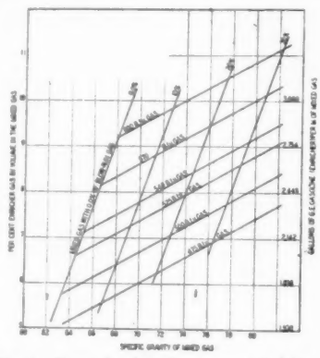

Fig. 3—Chart showing the per cent enricher gas and gallons of G. E. gasoline (enricher) per M of mixed gas using various amounts of blow run gas with the blue gas, for mixed gas having a calorific value varying from 475 to 600 B.t.u. and showing the relation of specific gravity calculated on the following basis: Blue Gas = 33 B.t.u. per cu. ft. Blow run gas = 140 B.t.u. per cu. ft. G. E. gasoline (enricher gas) = 3242.6 B.t.u. per cubic foot. The respective specific gravities being 0.55, .924 and 1.9869.

The water gas set[2] was operated in the normal manner, using West Virginia coal as generator fuel, making the usual blow runs, but gas oil was not admitted to the carburetor although the blast gas was largely burned therein as usual. The lean gas comprising mixed water gas and blow-run gas was conducted directly to the relief holder uncarbureted. This lean gas was subsequently enriched while still warm at the outlet of the relief holder, from which it was withdrawn quite uniformly by the works exhauster, by the introduction of the gasified gasoline using approximately 9.2 per cent of the latter by gas volume in the production of 565 B.t.u. gas.

The gasoline was used directly from a tank car in which it was under 35-pound pressure. The liquid was withdrawn under its own vapor pressure and caused to pass through pressure reducing regulators, through a vaporizer wherein it was gasified, through an orifice meter and the pipe line connecting it with the lean unpurified gas. The vaporizer used comprised a simple and small, metal-tube heat exchanger in which some of the hot water overflowing from the condenser was the heating medium. The latent heat of vaporization of the gasoline was low as shown in Table 1, hence the high capacity of a small heat exchanger. The hook-up used at Muscatine is substantially and diagrammatically as shown in Figure 1.

A Parr recording calorimeter was used and also a Sargen calorimeter in determining the heating value of the gas. Analyses were made of the lean and of the carbureted gases. In Table 3 the composition and calorific values of these gases are shown.

TABLE 3

Showing the composition and calorific value of the finished, butane-carbureted gas and of the lean gas as made at Muscatine, using West Virginia coal as generator fuel.

	Finished Gas*	Lean Gas—Mixed Blue Gas and Blow-Run Gas
CO_2	7.72	8.6
Illuminants	.88	1.4
O_2	.40	.1
CO	22.62	26.4
H_2	29.00	32.7
CH_4	6.30	5.1
Butane (enricher gas)	9.18	....
N_2	23.90	25.8
Calculated B.t.u.	567	....
Actual B.t.u., shown by calorimeter	565	....
Specific gravity	0.814†	....

*Some air was added to the exhauster (common practice at this plant) for the purpose of aiding purification.
†Determined.

Summary and Conclusions

As a result of a study of some of the important properties of the highly volatile members of the paraffin series particularly those properties pertinent to the generation, distribution and utilization of manufactured gas and as a result of the commercial production of carbureted water gas for a brief period only in a small gas works, using these hydrocarbons as enricher it seems that some quite definite conclusions are justified relating to the possibilities in the commercial utilization of these materials for such a purpose. The following summary is made along with certain conclusions some of which later may require some modification which is not apparent now and which may become evident after prolonged usage of the new enricher.

One grade of G. E. gasoline comprising chiefly a mixture of normal and iso-butane, but containing approximately 5 per cent of propane and 2 per cent of pentane was used on a commercial scale in the production of carbureted water gas having a calorific value of 565 B.t.u. per

(Continued on Page 122)

[2]This work was done, through the courtesy of the officers of the United Light & Power Co. and the assistance of their engineers, at Muscatine, Iowa.

TABLE 1—Some of the Physical Constants and Properties of a Few of the Hydrocarbons of the Paraffin Series

	Boiling Point Degrees Fahrenheit	Weight of Liquid per Gallon Pounds	Specific Gravity of the Gas at 60° Fahr.	Cu. Ft. of Gas per Gal. of Liquid at 60°F.	B.t.u. per Gallon of Liquid	B.t.u. per Cu. Ft. of Gas at 60°F. and 760 mm. Pressure	Specific Heat of Gas at Constant Pressure B.t.u. per. Lb.	Latent Heat of Vaporization of Liquid B.t.u. per Gal.	Latent Heat of Vaporization of Liquid B.t.u. per Gal.	Calorific Value B.t.u. per Pound
Methane, CH_4	—259	3.420	0.554	80.6	81,400	1008.4	0.593	....	....	23,790
Ethane, C_2H_6	—128	3.716	1.038	46.7	83,000	1763.6	0.506	792	213	22,240
Propane, C_3H_8	—47.4	4.462	1.523	38.2	96,900	2519	0.475	830	186	21,629
Butane, C_4H_{10}	+31.5	4.997	2.007	32.5	106,500	3274	0.458	854	170.8	21,320
Iso-butane—	+13.0	....	....	....	....	....	....	....	....	....
Pentane C_5H_{12}	+96.9	5.214	2.491	27.3	110,200	4029	0.448	808	155	21,130
Hexane C_6H_{14}	+156.2	5.519	2.975	24.2	116,000	4784	0.442	790	143	21,019

TABLE 2—Showing the Temperatures Fahrenheit Below Which Condensation Begins (Dew Points) Under 5 and 60-Pound Gauge Pressures for Certain Individual Paraffin Hydrocarbons at Concentrations of 2 to 12 Per Cent in Water Gas ($CO+H_2$)

	2 Per Cent		4 Per Cent		6 Per Cent		8 Per Cent		10 Per Cent		12 Per Cent	
	5 Lbs.	60 Lbs.	5 Lbs.	60 Lbs.	5 Lbs.	60 Lbs.	5 Lbs.	60 Lbs.	5 Lbs.	60 Lbs.	5 Lbs.	60 Lbs.
Methane (CH_4)	—100	—100	—100	—100	—100	—100	—100	—100	—100	—100	—100	—100
Ethane (C_2H_6)	—100	—100	—100	—100	—100	—100	—100	—100	—100	—100	—100	—100
Propane (C_3H_8)	—100	—100	—100	— 95	—100	— 95	—100	— 80	—100	— 65	—100	— 65
Normal butane (C_4H_{10})	— 95	— 55	— 80	— 30	— 70	— 20	— 55	— 10	— 50	0	— 40	+ 10
Iso-butane (C_4H_{10})	—100	— 75	— 95	— 50	— 85	— 40	— 75	— 25	— 70	— 10	— 60	— 5
Normal pentane (C_5H_{12})	0	+ 5	0	+ 32	0	+ 45	+ 5	+ 55	+ 12	+ 65	+ 22	+ 75
Iso-pentane (C_5H_{12})	— 20	— 10	— 20	+ 20	— 20	+ 30	— 10	+ 40	0	+ 50	+ 10	+ 60

The above figures are based on calculations made with the use of vapor pressure charts and are believed accurate within the limits of accuracy required to illustrate the stability even at low temperatures of a gas such as water gas when enriched with propane, butane or mixtures of the two in amounts required to bring the former up to city gas standards and when the pressure conditions are those normally used in the distribution of city gas. No allowance has been made for solubility effect resulting from the absorption of hydrocarbons by drip condensate which might result when the carbureted gas is mixed with other gases containing condensable matter.

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A UNITED INDUSTRY

The oil industry will celebrate the Christmas season of 1927 with a more practical realization of the fruits of good will among men than in any other period in its history.

The whole experience of the industry during the past year has been a convincing lesson in the superiority of co-operation over competition. Excessive competition brought upon the oil business the most disastrous conditions that ever beset it and co-operation was found to be the only remedy.

Unrestricted competition had been given full sway only to make bad worse. The industry finally reached a state where the most persistent advocates of individualism had to confess that they saw no way out. It was at this stage that co-operation was presented as an alternative supported by the approval of the Federal Oil Board and public opinion.

Co-operation within the industry has now been tested and justified. It is recognized as the one hope for preventing recurrences of this year's deplorable experience. From top to bottom of the oil business the hope is general that co-operation may continue and extend throughout every branch of the industry until it is stabilized on a sound basis.

The most frequent comment since the Chicago meeting of the American Petroleum Institute has been gratified surprise at the harmonizing of hitherto conflicting views and the unification of the industry behind the definite program adopted by the directors.

At previous meetings and at the hearings before the Federal Oil Board at Washington differences of opinion seemed unbridgable but at Chicago it was developed that these differences were due to misunderstanding rather than principle.

President E. W. Clark was singularly happy in his opening address when he emphasized that varying ideas could not stop the progress of the industry, that the pressure of circumstances would compel it.

That, in fact, has been the history of the oil industry where sturdy individualism has counted for so much. Personal experience and self reliance naturally developed positive opinions clinging tenaciously to approved custom or championing innovations with similar determination, until demonstration ended argument.

The industry has been passing through such a phase in the case of co-operation for conservation. At the outset many believed that even talk of it was sheer waste of breath. They said the industry had got along without it and always would; and, anyway, it was folly to think of co-operation where competition was so extreme.

Conservation was just a notion, they said. Real oil men were concerned only with finding and producing the oil. But the day came when they also were concerned with checking the flood of oil that was threatening everybody in the industry.

Conservation became a practical question for oil men. The pressure of public and governmental opinion was supported by the logic of facts.

Unit operation was another matter of contention. Its advantages in a field like Persia controlled by a single company were obvious but America was not Persia. Our oil industry had been built up on an altogether different system which rested on individual enterprise. It was argued it was too late to try to introduce a new system and that, anyway, Americans believed our system had made us the leaders of the world in oil production and it would be fatal to upset it.

Constitutional and legal barriers, furthermore, made it impracticable and indeed impossible. The resulting controversy occupied a large part of the hearings before the Oil Board and since.

But, as President Clark intimated, differences of opinion cannot more than delay the progress of the industry in the face of the pressure of circumstances.

The need for conservation pointed to co-operation as the sole solution. The industry could not wait for the testing of compulsory unit operation or the outcome of that controversy. All the advantages of unit operation could be had by voluntary co-operation without the disadvantages seen by those opposing it as a compulsory policy.

The report of the Beaty Committee adopted by the directors of the Institute embodied the essentials of a practical policy on co-operation that met all requirements.

The same force of circumstances may be seen at work regarding the controversy over conservation of gas in the production of oil.

Although discussed considerably prior to that time it was first made a live topic in an address favoring unit operation delivered by Henry L. Doherty before the American Institute of Mining and Metallurgical Engineers in February, 1925. He called attention to the waste of energy in natural gas, as a power source in itself and as an expulsive agent for the petroleum with which it was associated.

His conclusions were supported by research undertaken at his direction by C. E. Beecher and I. P. Parkhurst in the following October, which showed that the viscosity and surface tension of oil are lowered by dissolved gases, under such pressures as exist in underground reservoirs, and that the oil is in a much more highly fluid condition than it is after the gases escape. Consequently, he argued for conservation of the gas to exert a maximum effect in keeping the oil in a highly fluid condition while they are in solution and in propelling the oil through the sands by their expansion as they come out from the solution.

While the controversy over unit operation remained unsettled the resort to the gas lift at Seminole established the value of conserving the gas as Mr. Doherty had argued. The investigations by the Marland Committee of the Institute resulted in a report of almost similar conclusions.

Looking back it is now seen that most of the controversy has been over the methods of application rather than the effective principles. Argument in such cases is apt to stray from the fundamental to the superficial, especially when methods also are important.

Mr. Doherty's telegram from his sick room to the president of the Institute at Chicago, regretting misunderstanding and expressing his readiness to join with his associates on the directorate in supporting the co-operative program adopted by the Institute should assure the solidarity of the industry at future hearings by the Oil Board and impress Congress and the country with the determination and ability of the industry to deal with its difficulties.

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DOMINATE

West Texas Production at New Record

Crane County Contributes Most to Increase, but Pecos and Winkler Do Their Share. Another Big Well in Yates

By C. D. Lockwood
Staff Correspondent, North and West Texas

FORT WORTH, Tex., Dec. 19.—A 15,977-bbl. increase in production was the principal noteworthy feature of a rather routine week in West Texas. Crane County contributed more than 6,000 bbls. toward this gain, while Pecos and Winkler Counties did their customary share. The total output of the West Texas fields this week amounted to 271,619 bbls., a new high record for all time.

The usual list of gushers in the Yates Pool of Pecos County and the Hendrick Pool of Winkler County was all that served to break the monotony out there during the past seven days. Twenty-one new locations were announced but six of these were in the Yates Pool, an equal number in the Hendrick Pool and four were in the Dora Roberts area of Howard County. Brewster, Pecos and Loving Counties each had one new wildcat location and there were two, also, in Menard County.

Pecos County operations fell off slightly during the week, as evidenced by a check of wells drilling in the Yates Pool. Last week the total was 85, of which number 32 were drilling. This week there were 76 operations in the Yates Pool and 36 were drilling. Locations are not being made as fast as the wells are completed now, and it is altogether probable that the number of active wells will slowly drop off during the next two months, especially if the new plan to prorate pipe line runs on the basis of proven acreage is put into effect, thereby removing the necessity for drilling up inside locations.

Resume of Operations

Following is a resume of operations in the two major fields in tabular form:

	Yates	Hendrick
Locations	15	9
Rigs	6	3
Rigging up	10	14
Drilling	36	33
Shut down	1	8
Fishing	1	7
Cemented or standardizing	2	13
Making oil but not completed	5	16
Total	76	103

The three major pools of West Texas, Church-Fields, Hendricks and Yates, are producing 205,835 bbls. out of the 271,619 bbls. total and the 348 wells in these three pools are averaging 591 bbls. per well. Hendrick Pool leads at present with 37 wells averaging 1,316 bbls. each, several of them pinched, too. The Yates Pool, of course, is handicapped because of pipe line proration but the 93 wells are still averaging 510 bbls. each.

Big Well in Yates

Another big well was added to the Yates Pool on the Crockett County side of the river. Gulf Production Co.'s No. 3 Thompson in Section 71, just north of its No. 2, came in last Friday evening flowing 480 bbls. an hour at 1,042 feet and ran wild. The tools could not be removed from the hole so the line had to be cut, dropping them to the bottom. The well was then brought under control and pinched to about 20 bbls. an hour, making 592 bbls. during the 24 hours ending Sunday morning. The surface elevation is 2,154 feet and the structural position of this test is a little higher than that of the other two wells on this property, which is in accordance with previous ideas of the subsurface. While this is an edge well, extending production a few feet, it does not mean much for the Crockett County direction. Gulf's No. 1, it is remembered, flowed about 700 bbls. an hour when it blew in September 13 at 988 feet, but later went entirely to water. Gulf's Nos. 1 and 2 flowed 825 bbls. of pipe line oil last Saturday. The day previous, No. 1 was shut in entirely and No. 2 flowed 125 bbls. of net oil and 35 per cent water.

River Bed Wells

The River Bed wells flowed 505 bbls. Saturday, No. 1 making 28 per cent water; No. 3, 20 per cent, and No. 4, 20 per cent. The day before, No. 1 made 28 per cent water, No. 3 made clean pipe line oil and No. 4 made only 3 per cent water, the total oil output having been 391 bbls. Marland Oil Co.'s No. 1 Yates-A produced 210 bbls. of oil, net, and 62 per cent water Saturday; No. 2 made 375 bbls. of oil with no water and the remainder of the wells on this property were shut in.

Marland Oil Co.'s No. 10 Yates-A, located 1,493 feet south and 330 feet east of the northwest corner of its lease in Section 60, Block 1, flowed 300 bbls. an hour at 1,014 feet and was completed at 1,038 feet. This well made 120 bbls. hourly at 999 feet, 150 bbls. an hour at 1,002 feet, 170 bbls. hourly at 1,010 feet and kept on increasing to 300 bbls. per hour.

Humble Oil & Refining Co.'s No. 4 Smith in the SE cor. of Section 36, Block 194, flowed 215 bbls. an hour at 1,650 feet. This is an inside location, being on a direct line between Humble's No. 2 on the same lease, and Red Bank Oil Co.'s No. 1 Smith. However, it is half a mile south of No. 2 which was good for only 132 bbls. an hour on the December 1 proration gauge.

Marland Oil Co.'s No. 9 Yates-A in Section 60, Block 1, should also be mentioned since it flowed 800 bbls. in six hours before it was shut in at 1,030 feet

Winkler County

In Winkler County, Gulf Production Co.'s No. 5 Hendricks, SW SE NW of Section 34, Block B-5, flowed 235 bbls. at 2,833-40 feet and increased to 75 bbls. per hour at 2,875-80 feet. The gas also increased to about 30,000,000 feet. The tools were pulled out and the well pinched to 677 bbls. in 24 hours. It was estimated good for 1,800 bbls. initial.

Magnolia Petroleum Co.'s No. 2 Ida Hendrick, SW cor. W half NE Section 29, Block B-5, flowed 1,320 bbls. of fluid, but 200 bbls. was salt water. Pay was topped at 2,865 feet and drilling was stopped at 2,955 feet. This water is apparently coming from adjoining rotary holes. At least, it seems to be upper water and is probably not serious.

Atlantic Oil Producing Co.'s No. 1 Grisham-Hunter in the NW cor. E half SW of Section 34, south offset to Gulf Production Co.'s No. 5 T. G. Hendrick, increased to 3,099 bbls. at total depth of 3,019 feet and was temporarily completed. Top of pay was 2,826 feet.

An important well drilled in last week was Republic Production Co.'s No. 1 Grisham-Hunter-A, in the NW cor. E half SW of Section 44, Block 26, in the north end of the field. It topped the big pay at 2,865 feet and drilled 2 feet in, making 6,010 bbls. the first 24 hours. Two days later it had dropped to 4,140 bbls., however, and is to be deepened. Roxana Petroleum Corp.'s north offset to this well, No. 1 Grisham-Hunter-A, which started spraying oil several weeks ago, blew up the separator December 14 and is now flowing 300 bbls. daily.

Ector County

The Texas Company has proven that the Ector County Field does not extend to the south. The Texas Company and J. S. Cosden's No. 5 Connell, in the SE cor. of Section 24, Block B-16, School Land, is 117 feet lower on the lime than No. 1. It had a small showing of oil at 3,624 feet but did not amount to much. Eight-inch casing is being set at that depth.

In Pecos County, Gulf Production Co.'s No. 2 Smith was estimated good for 5,400 bbls. at 1,483 feet. Top of pay was 1,295 feet and the flow increased to 95 bbls. an hour at 1,420-23 feet.

WILDCAT OPERATIONS IN WEST TEXAS

Week ending December 17, 1927

Company, farm and location—	Remarks—
ANDREWS COUNTY	
George B. Calvin's (was Calvin & Belt's) No. 1 Ratliff & Bedford, C NE Sec. 16, Blk. A-54	Hole full fresh water 1,055 ft.; top salt 1,610 ft.; drlg. 3,570 ft.
J. S. Cosden's No. 1 Ratliff & Bedford, C SE Sec. 8, Blk. 73, Public School Land	Top salt 1,585 ft.; shut down 4,116 ft., contract depth; will deepen.
Deep Rock Oil Co.'s No. 1 W. J. Harris, C SE Sec. 12, Blk. A-46, Public School Land, elev. 3,167 ft.	Hole full fresh water 1,050 ft.; drlg. 1,090 ft.
B. B. McKennon's (was Neff et al's) No. 1 J. S. Means, C SE Sec. 12, Blk. A-35, Public School Land	Set 8-in. 1,385 ft.; clean. out.
A. G. Carter & Zweifel's No. 1 Cowden, C SE Sec. 18, Blk. A-52, Public School Land Sur., elev. 3,156 ft.	Top salt 1,375 ft.; encountered pocket of air 3,635 ft.; drlg. 4,900 ft.
BORDEN COUNTY	
Marland Oil Co.'s No. 1 G. E. McDavid, C SW Sec. 156 Blk. 25, H. & T. C. Sur.	Drlg. 1,335 ft.
BREWSTER COUNTY	
Cady & Keller's No. 1 Decies	Rig on ground.
Cowden & Bowser's No. 1 Jackson & Harmon	Drlg. 600 ft.
J. M. Hickey's No. 1 Jackson & Harmon, NE cor. Sec. 182, Blk. 9, G. H. & S. A. Sur.	Drlg. 600 ft.
Mid-Kansas O. & G. Co.'s No. 1 Turney, Sec. 77, Blk. 213, T. & St. L. Sur.	Drlg. lime and chert 2,300 ft.
Reese & White's No. 1 Kimbale, C NE Sec. 204, Blk. 9 G. H. & S. A. Sur.	Shut down for underreamer 1,306 ft.
Van McPhail's No. 1 McIntyre, SE cor. Sec. 59, Blk. 352, 7 mi. S of Alpine	Drlg. 1,100 ft.
Wilcox & Anderson's No. 1 Gage, Sec. 8, Blk. 300, T. C. R. R. Sur.	Drlg. 1,800 ft.
COKE COUNTY	
W. H. Brown et al's No. 1 W. L. Foster, SE cor. Sec. 142, Blk. 2, H. & T. C. Sur., elev. 2,222 ft.	Shut down 2,250 ft.
Danciger O. & R. Co.'s No. 1 Mrs. Byrnes, Clinton Sur.	Drlg. 3,125 ft.
Lipan Oil Co.'s No. 1 S. M. Conner, Sec. 71, Blk. 2, H. & T. C. Sur.	Show oil 1,224-34 ft.; shut down lime 3,317 ft.
Lipan Oil Co.'s No. 1 E. C. Rawlings, Sec. 390, Blk. 1-A, H. & T. C. Sur., elev. 2,750 ft.	Total depth 2,236 ft.; shut down.
CONCHO COUNTY	
Parks & Lawson's No. 1 Schultz	Show oil 925 ft.; shot with 40 and 30 qts.; no results; drlg. 1,170 ft.
The Exploration Co.'s No. 1 Hartgrove, Blk. 240, J. Schouch Sur. elev. 1,718 ft.	Set 10-in. 760 ft.; clean. out.
CRANE COUNTY	
Crane Dev. Co.'s No. 1 J. R. Mosley, S cor. Sec. 18, Blk. 6, H. & T. C. Sur.	Drlg. 640 ft.
Gulf Prod. Co.'s No. 3 W. N. Waddell, SE cor. NE Sec. 3, Blk. B-25, Public School Land	Drlg. 1,100 ft.
J. K. Hughes Dev. Co.'s No. 1 State Bank Commission, CSL Sec. 18, Blk. 4, H. & T. C. Sur.	Location.
Humble O. & R. Co.'s No. 1 University-B	Rigging up.
Independent O. & G. Co.'s No. 1 University-B	Building rig.
Texas Development Co.'s No. 1 J. Cowden	Top lime 2,635 ft.; drlg. 4,240 ft.
CROCKETT COUNTY	
George Anderson and Marland Oil Co.'s No. 1 University	Hole full sulphur water 1,800 ft.; ½ bailer oil 2,240 ft.; ½ bailer sulphur water per hour 2,475 ft.; shut down 2,631 ft.
V. T. Bolin & Co.'s No. 1 P. C. Coates, NW cor. SW Sec. 4, Blk. 2, I. & G. N. Sur.	Shut down 2,110 ft.
Corbett & Gill's No. 1 University	Top salt 855 ft.; smell gas 1,800 ft.; hole full sulphur water 1,985-90 ft.; shut down 2,105 ft.
J. S. Cosden, Inc., No. 1 Paul Perner, SW cor. Sec. 36, Blk. 2, I. & G. N. Sur.	Shut down 595 ft. for 15-in. pipe.
Gulf Prod. Co.'s No. 3 Thompson	Flowed 480 bbls. per hr.; ran wild; dropped tools and line in hole; pinched to 592 bbls. day; top pay and total depth 1,042 ft.
C. A. Jones et al's No. 1 Powell	Top salt 1,050 ft.; hole full water 2,245 ft.; 1,500 ft. oil 2,590-2,634 ft.; shot 50 qts. 2,612-34 ft.; 2,500 ft. oil; swabbed 85 bbls.
James Kelly et al's (was Corbett & Gill's) No. 1 Todd, C NE Sec. 43, Blk. WX, G. C. & S. F. Sur.	Top salt 993 ft.; show oil 1,948 ft.; 700 ft. sulphur water in hole, 2,450 ft.; total depth 2,605 ft.; plugged back to 1,948 ft. and shot 120 qts. 1,909-45 ft.; bridged.
Van McPhail's No. 1 George Thompson	Location.
Van McPhail's et al's No. 1 George Thompson	Location.
Magnolia Pet. Co.'s No. 2 Shannon	Show oil 2,385-90 and 2,992 ft.; total depth 4,100 ft.; fish. 20 joints 8-in. casing.
Osage Oil Corp.'s No. 1 H. M. Halff	Drlg. 500 ft.
Bob Penn's No. 1 L. P. Powell	Drlg. 2,560 ft.
William Shaffer et al's No. 1 University, C SE SE Sec. 9 Blk. 47, University Sur., elev. 2,344 ft.	Shut down 2,344 ft.

(Continued on Page 140)

WEST TEXAS DISTRICT
Daily Average Production for the Week Ending December 17

Big Lake Field	23,157
Crane County	110,215
Crockett County	2,579
Ector County	15
Glasscock County	S. D.
Howard County	6,061
Jones County	1,367
Loving County	75
Mitchell County	3,392
Pecos County	53,520
Runnells County	85
Scurry County	45
Upton County	17,291
Winkler County	53,817
Total West Texas	271,619

Daily Average Production by Leases
Crane County

Company and Lease—	Wells	Prod.
Church et al:		
University	1	61
Church & Weekley:		
University	3	1,357
Church & Fields:		
Duoll-University	1	135
Eastland Oil & Collett:		
University	8	7,819
Gulf Prod. Co.:		
All leases	65	19,850
Humble O. & R. Co.:		
University	13	6,539
Independent O. & G. Co.:		
University-A	5	1,428
University-B	1	1,017
Landreth Prod. Corp.:		
Cowden-Anderson	16	12,217
Magnolia Pet. Co.:		
University-Hardwicke	11	2,587
University-O'Keefe	12	2,137

State-Lasseter	3	168
Magnolia Pet. Co. et al:		
University	4	51
Total Magnolia Co.	30	4.943
Pecos Oil Co.:		
University	11	4.729
Prairie O. & G. Co.:		
University	6	245
State-Lasse.er	5	12.285
Total Prairie Co.	11	12.530
Simms & Atlantic:		
University-A	9	3.195
University-B	1	54
University-C	8	16.923
University-D	9	5.385
University-E	1	158
Total Simms & Atlantic	28	26.215
Stidham & Thrasher:		
University	1	12
The Texas Company:		
University	1	247
University-Beasley	1	25
Tidal Oil Co. et al:		
University-B	2	78
University-C	1	81
University-E	1	81
University-F	7	3.229
University-G	2	258
University-H	2	40
University-I	8	5.370
Total Tidal Co.	23	9.134
Total Church & Fields-McElroy Pools	218	109.226
Miscellaneous Crane County		
Gulf Prod. Co.:		
Waddell	1	17
Independent O. & G. Co.:		
Hughes	1	7
McMan O. & G. Co.:		
Hughes	2	69
Marland Oil Co.:		
All leases	16	667
The Texas Company:		
King	9	229
Union Land-F	1	0
Miscellaneous total	30	989
Grand total Crane County	248	110.215
Pecos County		
Allsman & Bell:		
Pecos River Bed	3	399
California Co.:		
Yates	6	6.847
Smith	3	1.378
Humble Oil & R. Co.:		
M. A. Smith	3	836
M. A. Smith-B	2	1.503
Kirby Pet. Co. & Edson:		
J. H. Tippett	1	63
Marland Oil Co.:		
Yates-A	8	2.181
Mazda & Savoy Oil Co.:		
M. A. Smith	1	174
McMan & Marland:		
Yates	11	5.565
Red Bank Oil Co.:		
Smith	2	189
Simms Oil Co.:		
Smith	3	4.960
Roxana Pet. Corp.:		
Tippett	3	1.254
Smith	2	104
Mid-Kansas & Transcontinental:		
Yates-A	8	7.825
Yates-B	11	6.552
Yates-C	6	2.616
Yates-D	1	1.650
Yates-E	1	597
Smith-Taylor	6	2.856
Total Mid-Kansas and Transcontinental	33	22.096
Texon O. & L. Co.:		
Yates	2	0
Total Yates Field	93	47.559
Winkler County		
Southern Crude Co.:		
T-67 Hendricks-A	1	284
T-67 Hendricks-C	4	2.690
T-67 Hendricks-F	1	2.036
T-88 Hendricks-B	1	5.059
T-89 Grisham-Hunter-A	1	56
3-T-67 Grisham-Hunter-A	1	Dead
T-88 Hendrick-A		1.136
Total Southern Crude Co.	10	11.235
Republic Prod. Co.:		
Grisham-Hunter-A	1	1.661
Murchison et al:		
Grisham-Hunter	3	470
Grisham-Hunter-C	1	173
Grisham-Hunter-B	1	319
Cranfill & Reynolds:		
Ida Hendrick	2	6.695
Atlantic O. P. Co.:		
Grisham-Hunter	1	2.990
Ida Hendrick	1	220
Humble O. & R. Co.:		
Grisham-Hunter-4	1	908
Ida Hendrick-B	1	2.070
Independent O. & G. Co.:		
Grisham-Hunter	2	2.797
Hendrick	1	0
Ida Hendrick	1	308
Landreth Prod. Corp.:		
Grisham-Hunter	2	5.1[illegible]
Ida Hendricks-A	2	3.152
The Texas Company:		
Grisham-Hunter	1	572
Roxana Pet. Corp.:		
Grisham-Hunter-A	1	21
Ida Hendrick-C	1	5.711
Roxana Corp. et al:		
Scarborough	1	20
Texon O. & L. Co.:		
Grisham-Hunter-A	1	2.023
Turman et al:		
Ida Hendrick	1	30
Magnolia Pet. Co.:		
Ida Hendrick	2	2.856
Total Winkler County	37	49.050

WEST TEXAS COMPLETIONS

Crockett County

McMannon Oil Co.'s No. 1 Blakeney is plugging to abandon at 4,050 feet.

Crane County

Duffey & Gault & Brown's No. 1 Cowden Bros. & Co., was dry and abandoned at 3,422 feet. It encountered water at 3,220 feet, with an increase to three-quarters of a bailer per hour at 3,295 feet.

Magnolia Petroleum Co.'s No. 13 University-Hardwicke made 600 bbls. after a 100-quart shot at 2,950-71 feet; No. 14 flowed 1,008 bbls. at 2,822-88 feet. Pecos Oil Co.'s No. 13 University flowed 615 bbls. from pay at 2,800-2,960 feet and after a 415-quart shot at 2,800-2,916 feet flowed 1,005 bbls. Same company's No. 14 University flowed 665 bbls. at 2,800-2,950 feet, and increased to 925 bbls. as a result of a 470-quart shot placed at 2,790-2,950 feet. Prairie Oil & Gas Co.'s No. 7 State-Lasseter was plugged back from 2,990 to 2,960 feet. Top of pay was 2,918 feet. It was shot with 100 quarts from 2,900 to 2,960 feet and swabbed 70 bbls. afterwards.

Simms & Atlantic's No. 12 University-D flowed 70 bbls. an hour at 2,815-85 feet.

Howard County

Marland Oil Co.'s No. 2 Otis Chalk-E made 140 bbls. after a 10-quart shot at 1,744-49 feet. Top of sand was 1,740 feet and total depth 1,750 feet.

Jones County

Gibson & Johnson's No. 1 R. J. Camp was dry and abandoned at 2,208 feet.

Pecos County

Garland & Mott's No. 1 El Paso Cattle Loan Co. was plugged and abandoned. Total depth was 3,501 feet. A 100-quart shot at 1,440-60 feet was unsuccessful.

Humble Oil & Refining Co.'s No. 1 Smith-B, Section 101, Block 194, flowed 85 bbls. per hour at 1,340-1,512 feet. Marland Oil Co.'s No. 6 Yates-A in Section 60, Block 1, flowed 92 bbls. per hour at 955-1,038 feet; No. 7 Yates-A flowed 31 bbls. hourly, open, with 3 per cent water, at 1,061-1,110 feet; No. 8 Yates-A flowed 20 bbls. hourly, flowing open, at 991-1,032 feet. It had 9 per cent water.

Mid-Kansas & Transcontinental's No. 5 Smith-Taylor flowed 200 bbls. an hour, open, at 1,165-1,305 feet; No. 6 Smith-Taylor made 2,160 bbls. the first 10 hours through one 4-inch line at 1,178-1,229 feet; No. 7 Yates-B flowed 230 bbls. the first 9 minutes at 1,132-1,268 feet; No. 16 Yates-B made 1,004 bbls. the first 9 hours through one 4-inch line. Pay was from 1,010 to 1,050 feet. Same companies' No. 8 Yates-C flowed 2,830 bbls. in 24 hours at total depth of 602 feet, which depth was also the top of the pay. Nine hours of this flow was through one 4-inch line, 6 hours was through a cracked 4-inch valve and 9 hours was flowing open.

Roxana Petroleum Corp.'s No. 1 Tippett was deepened from 1,400 feet to 1,462 feet, and flowed 180 bbls. an hour. Top of pay was 1,356 feet.

Upton County

The Texas Company's No. 4 Perry, which was completed for 118 bbls., 42 per cent water, at 1,993-95 feet several weeks ago, is being deepened at 2,025 feet.

Winkler County

Independent Oil & Gas Co.'s No. 1 Ida Hendricks-B, was shot with 380 quarts at 2,940-3,040 feet and flowed 520 bbls. Top of pay was 2,846 feet and total depth 3,043 feet.

Southern Crude Oil Purchasing Co.'s No. 1 Grisham-Hunter T-89-A was completed for 65 bbls. of oil and 30,000,000 feet of gas at 2,665-87 feet.

Landreth Production Corp. & Roxana Petroleum Corp.'s No. 2 Grisham-Hunter, which topped the pay at 2,817 feet and was completed recently for 1,400 bbls. at 2,947 feet, is being deepened at 2,981 feet and flowed 1,695 bbls.

WEST TEXAS LOCATIONS

The following are some of the more important locations made in West Texas during the closing days of last week:

Pecos County

Gulf Production Co.'s No. 6 Smith, 1,973 south line and 260 feet west of the NE cor. Gulf Co.'s lease, Section 28, Block 194, G. C. & S. F. Survey. Gulf Co.'s No. 7 Smith, 2,104 feet south and 937 feet west of NE cor. of same lease. Buell and Hagen's No. 1 Pryor and Wilson, 1,570 feet from the south line and 2,240 feet from the east line of Section 16, Block 5, T. C. R. R. Survey. California Co.'s No. 8 M. A. Smith, (lease 3) 1,406 feet from the north line and 1,565 feet from the east line, Section 35, Block 194 G. C. & S. F. Survey. California Co.'s No. 9 I. G. Yates, lease 1, 1,717 feet from the most northerly south line and 1,953 feet from the west line of Section 34, Block 194 and No. 10 I. G. Yates, 1,717 feet from the most northerly south line and 1,412 feet from the west line of Section 34, Block 194, G. C. & S. F. Survey. Allsman and Bell's No. 8 River Bed, center of river and between Gulf Co.'s No. 3 Thompson and Mid-Kansas and Transcontinental Co.'s No. 18 Yates B or 1,628 feet north of south line of Section 61 in Pecos River bed.

Winkler County

Gulf Production Co.'s No. 8 T. G. Hendrick, 330 feet north and west of SE cor. NW Section 78, Block B-5. Gulf Co.'s No. 9 T. G. Hendrick, 990 feet north and 330 feet east of SW cor. NW Section 24, Block B-5. The Texas Company's No. 4 Grisham-Hunter-B, NW cor. SE Section 34, Block B-5. Same company's No. 1 Grisham-Hunter-C, NW cor. SE Section 45, Block 26, Roxana Petroleum Corp.'s No. 2 Ida Hendrick-B, 990 feet from south line and 2,310 feet from east line, Section 29, Block B-5. Turman and Maxwell's No. 4 Ida Hendrick, SE cor. E half, NE Section 29, Block B-5.

Brewster County

Cowden and Bowser's No. 1 Jackson-Harmon, C N half, Section 1, Block 331, T. C. R. R. Survey.

Loving County

Delaware Oil Co.'s No. 1 Lockhart and Ramsey, 330 feet from east corner of W quarter Section 79, Block 1, W. & N. W. Survey.

Menard County

May and Clark's No. 1 Callan Ranch, 990 feet from south and east lines of Section 22, B. S. & F. (W. S. Strader) Survey. Renfro and associates' No. 1 J. Davis, C NW SW, Jacob Brecher Survey No. 79.

Late News from the Fields

OKLAHOMA

The Greater Seminole region produced 370,487 bbls. from 1,051 wells on Tuesday of this week. The production by pools was:

	Barrels
Little River	28,806
Bowlegs	110,566
Earlsboro	144,766
Seminole	54,703
Searight	21,646
Total	370,487

The most important developments in that area were the completion of a well which found the sand 356 feet lower than the offset which was a dry hole, and a deep failure. This sensational well was the Barnsdall Oil Co.'s No. 2 Sango, NE cor. SE NW Section 1-9-5, which had the Wilcox sand 4,704-08 feet, and flowed 3,129 bbls. The offset was the Superior Oil Corp.'s dry hole, which had a total depth of 4,348 feet. One more for the crooked holes of Seminole.

An important well which is apparently a failure in the Wilcox sand is the Barnsdall Oil Co.'s No. 1 Holutke, in Section 22-7-6. This well, by correlation of the formations, was believed to be running at least 110 feet high. A big well was naturally expected on the evidence of this structural position, but the well found a few grains of Wilcox sand mixed with some Simpson sand at 4,266 feet, and after drilling to 4,268 feet, 200 feet of water was found in the hole. This amount could not be bailed down and later increased to 350 feet while bailing was in progress. It seems to indicate that the well resembles some of the wells on the east side of the Little River Pool, which found water in the top of the Wilcox. The owners will swab the well in an effort to exhaust the water.

The failure of this well eliminates from further consideration one more spot which was considered threatening.

NORTH LOUISIANA

SHREVEPORT, La., Dec. 20.—Palmer Corp.'s West Carroll Parish wildcat, No. 1 White, in Section 2-19-10, apparently is a disappointment. Bailed Saturday, it showed salt water and is now shut in. Total depth is reported as 2,466 feet, with sand said to be the second Monroe gas rock, topped at around 2,400 feet. Two weeks ago it made considerable of a show, pushing drilling fluid out of the hole; but the test Saturday showed salt water pressure instead of the gas that was at first supposed. The location is 35 miles east and northeast from production in the Monroe and Richland gas fields.

Magnolia Petroleum Co.'s No. 21 Robert Shaw, in Section 23-21-15, Caddo Parish, is behaving a little better than recent 3,900-foot completions in the new Pine Island deep stuff. Drilled 3,928 feet before setting casing at 3,928 feet, it was tested at 3,881-84 feet and completed a 625-bbl. producer Saturday. Monday it gauged 950 bbls.

Benson Oil Co.'s No. 1 Wolff, in Section 3-10-13, is running tubing in an effort to make the well flow. With the bottom 12 feet in a sand, total depth 3,008 feet, the wildcat is getting stronger with age and where it started bailing and swabbing about 80 bbls. of 43 gravity oil late last week is now making small heads at frequent intervals estimated at 90 bbls. per day.

Seminole Operators Extend the Agreement Sixty Days Further

A meeting of the companies and individuals operating in the Greater Seminole area was held in Tulsa last week and after a discussion voted unanimously to extend the current agreement for a period of 60 days after January 1, 1928, when the agreement was to have expired. This is an extension of the original plan which became effective upon ratification by the Oklahoma State Corporation Commission.

Although the output of this region is slipping, there are many spots which are considered threatening, and it is these potential menaces which the Seminole committee and the umpire are anxious to eliminate.

Under the present plan of operation, all wildcat wells will be held to a production of 100 bbls. per day providing that no derricks are built on adjacent leases. The owners of leases close to these wells have signified their intention to comply with every provision of the agreement. At this time there are five wells shut in under this agreement, and all of them have found the Wilcox productive. Should they be thrown wide open and the contents of the Wilcox explored, it is reasonable to expect at least 400 wells to be started as a result.

The agreement reached last week is far-reaching in effect as it automatically eliminates any possibility of a flood of crude being thrown upon the market from the new territories of Seminole until at least the first of June. If March 1 continues as the time when the potentialities of the five wells will be tested out, then at least 100 days must elapse before any heavy production may be expected from these areas, and that means that June will be with us, and possibly a different outlook be in evidence for the entire structure of oildom.

PURE OIL ADVANCES PRICE

Closely following the announcement of a 5-cent advance in the market price of crudes produced in New York, Pennsylvania and West Virginia and a 10-cent advance in southeastern Ohio crude posted by the Seep Purchasing Agency on December 17 the Pure Oil Co. announced that it would pay $3.10 for Cabin Creek crude; $2.85 for Kelly's Creek crude and $2.75 for Bradford Hollow crude, all produced in West Virginia.

Panhandle and North Texas Operations

Gas Lift Experiment in Sanford Area, Hutchinson County, Most Successful. Freak Occurrence in Gray County

By James H. Dameron
Staff Correspondent, Texas Panhandle

FORT WORTH, Tex., Dec. 19.—Aside from the developments at Skyrocket Oil Co.'s No. 1 Jameson in the south central part of the Antonio Dubio Survey in Hutchinson County, there were few above the average developments in the Panhandle of Texas. Several wells in Gray County and particularly in the Bowers area are nearing completion and will probably be completed before the holiday shut down. But except in few instances, barring the unexpected, nothing of an exciting nature is likely to happen in the wildcat areas before the first of the year.

Skyrocket Co.'s test, which is about a mile from the Moore County line and about 6 miles south and 2 miles east of the Skelly Oil Co.'s No. 1 Armstrong in the SW cor. of the Freeman Bazemore Survey, topped the pay at 3,147 feet and is estimated to be good for 25 to 100 bbls. at that depth. The Skelly well had a maximum production of 200 bbls. daily soon after it was drilled in and that company is drilling its second well on the lease.

The hole is caving badly at the Skyrocket test and according to field reports anywhere from 70 to 150 feet of oil rose in the hole before the hole started caving. The test had a very small show of oil at 3,105 feet and another show at 3,114-29 feet. Drilling was stopped at 3,147 feet and will be resumed when the hole is cleaned out.

Gas Lift Success

Phillips Petroleum Co.'s No. 1 J. M. Sanford (Land), Section 83, Block 46, in the Sanford area of Hutchinson County, was put on gas lift last week and started off doing 1,080 bbls. of fluid, 10 per cent water. The well was completed November 25 flowing 530 bbls. the first 24 hours from 2,967-75 feet. It is one of the most successful of the gas lift experiments carried on in that area. Most of the other experiments with gas lift in that area have been either failures or were far below expectations. Antelope Creek Oil Co.'s No. 2 J. M. Sanford had the pay at 3,050 feet and bottomed at 3,082 feet this week and flowed 5 bbls. of oil and 100 bbls. of salt water when put on gas lift.

Over east in the McIlroy Pool First National Oil Co.'s and Lane's No. 1 Ellis Cockrell was completed as a 1,000-bbl. well, showing 2 per cent water. The well was formerly operated by White and Lane. No. 2 on the same lease topped the pay at 3,020 feet and is drilling at 3,022 feet with 200 feet of oil in the hole.

A freak occurrence was reported from the Gulf-Saunders area in Gray county when Roxana Petroluem Corp.'s No. 1 Worley was being plugged. The well was pumping mud and water for two days before the permit to plug was obtained and showing no oil. When the 5-inch was pulled up a little the well made a small head and made four other small heads. Approximately 1,500 feet of oil rose in the hole and it was swabbed to within 200 feet of the bottom. The oil filled up again to around 1,500 feet.

Bowers Area

No completions were reported from the Bowers area in Gray County, however, a few wells in that pool are at a stage of completion that will likely cause them to be completed before the holidays. Danciger Oil & Refining Co.'s No. 4 Jackson flowed 225 bbls. in 24 hours from the first granite wash pay at 2,990-95 feet and is being drilled ahead. Delaney and associates' No. 2 Jackson is drilling at 2,760 feet and the well is making 11,000,000 feet of gas. Midwest Exploration Co.'s No. 1 Bowers topped the granite wash at 2,785 feet and is drilling ahead.

On the Phillips Petroleum Co.'s lease No. 1 W. Jackson is drilling through dry gas pay at 2,845 feet. No. 2 on the same lease has 1,000 feet of oil in the hole and is drilling ahead at 2,832 feet. That company's No. 1 Jackson-Riley swabbed 160 bbls. from 2,981 feet after getting a show of oil at 2,942-54 feet. Skelly Oil Co.'s No. 1 Jackson got a show of oil at 2,865-70 feet and the remaining drilling wells in that pool are drilling at considerable lessor depths. Only one new location was made in the Bowers area last week.

Completions of two gas wells and the announcement of three new locations in Wheeler County enlivened that section of the Panhandle. One of the gas wells was a 21,000,000-foot well and the other was a 5,000,000-foot well. Mid-Kansas Oil & Gas Co. staked locations for two tests in that county and Watchorn Oil & Gas Co. staked the location for another test in Wheeler. Drilling, generally, in Wheeler County has shown a slight increase in the past few weeks.

Deep Tests Abandoned

Two deep tests in the Panhandle were abandoned during the curfent week. In Armstrong County Meadows and associates' test was plugged and abandoned at 4,295 feet and in Childress County the Continental Oil Co.'s No. 1 B. F. Smith was plugged and abandoned when the tools were lost at 3,580 feet after encountering sulphur water at 3,350-55 feet. Amarillo Oil Co. made locations for a test each in Moore and Potter Counties.

Locations and completions were even during the past week with seven of each being reported. The following new locations were reported at the end of the week.

New Locations

Gray County—Phillips Petroleum Co.'s No. 3 Jackson-Riley, SW cor. W half SW Section 88, Block B-2, H. & G. N. Survey, cellar and rig on the ground. Guernsey Oil Co.'s No. 2 B. E. McKinney, 264 feet from the south line and 330 feet from the west line of north 160 acres of south 240 acres of the west 400 acres of Section 163, Block 3, I. & G. N. Survey.

Wheeler County—Mid-Kansas Oil & Gas Co.'s No. 1 J. F. Coates, 330 feet from NW cor. W half SE Section 93, Block 17, H. & G. N. Survey. Mid-Kansas Co.'s No. 1 J. L. Newton, SW cor. W half NW Section 92, Block 17, H. & G. N. Survey; Watchorn Oil & Gas Co.'s No. 2 Binkley and Caine, C SW, SW Section 19, Block 24, H. & G. N. Survey.

Moore County—Amarillo Oil Co.'s No. 1 Thompson-Amarillo, C Section 22, Block 26, E. L. & R. R. Survey.

Potter County—Amarillo Oil Co.'s No. 1-K R. B. Masterson, C SW, Section 85, Block O-18 D. & P. R. R. Survey.

Hutchinson County—Phillips Petroleum Co.'s No. 1 Ellis Cockrell, 330 feet from the south line and west line of SW SW Section 2, Block Y, M. & C. Survey.

Production Off

Due principally to cold weather Panhandle production was off 3,150 bbls. in daily average. Hutchinson County alone declined 3.245 bbls. and Carson County was off 585 bbls. Gray County and Wheeler County cut down the losses to some extent with a gain of 485 bbls. and 195 bbls. respectively. Production by counties follows:

Carson County	7,530
Gray County	19,740
Hutchinson County	54,530
Moore County	0
Potter County	30
Wheeler County	1,380
Total this week	83,210
Total last week	86,360
Decrease	3,150

COMPLETIONS

Armstrong County

Meadows and associates' No. 1 E. D. Harrell was plugged and abandoned at 4,295 feet.

Childress County

Continental Oil Co.'s No. 1 B. F. Smith, C NE Section 14, Block 9, encountered sulphur water at 3,350-55 feet and was plugged when the bit was lost at 3,580 feet.

Carson County

Last Chance Oil Co.'s No. 1 J. W. McConnell was completed in granite wash at 3,250-90 feet making 165 bbls initially. The well is now making around 60 bbls. daily.

Gray County

Cole Oil & Gas Co.'s No. 1 J. E. Williams has been temporarily abandoned at 3,850 feet. Location was abandoned for Sullivan and associates' No. 1 A. Chapman.

Hutchinson County

First National Oil Co.'s No. 1 Ellis Cockrell (formerly White and Lane's No. 1 Cockrell) was completed at 2,980-81 feet making 1,000 bbls. of fluid, 2 per cent water. The Texas Company's No. 2. T. D. Lewis topped the lime at 2,925 feet and bottomed at 3,090 feet. The well was shot with 110 quarts at 2,925 feet and swabbed 10 bbls. of oil and 20 bbls. of water after the shot.

WILDCAT OPERATIONS IN PANHANDLE

Week Ending December 17, 1927

ARMSTRONG COUNTY

Company, Well, Farm, Name, Section and Block—	Remarks—
United Oil & Trust Co.'s No. 1 J. P. Reck, Sec. 162, Blk. 4, H. & G. N. Sur.	Drilling red rock and salt, 1,824 ft.

BAILEY COUNTY

Gibson Oil Co. et al's No. 1 Webb Miller, NE cor. Sec. 15, League 186, Swisher County school land	Rig.
Humble O. & R. Co.'s No. 1 W. H. Fuqua, C E ½, Sec. 117, Blk. A, Melvin, Blum & Blum Sur.	Fish for U. R. lugs, 2,085 ft.

BRISCOE COUNTY

C. S. Rice's No. 1 J. C. Anderson, SE cor. NW NW, Sec. 22, Blk. B-3, B. S. & F. Sur.	S.D., 1,620 ft.

CARSON COUNTY

Amatex Dev. Co.'s No. 1 E. S. Polling, Sec. 22, Blk. 2-Y	T.A., 2,110 ft.
Marston Oil Co.'s No. 1 J. L. Noel	S.D., 3,064 ft.
Navajo Oil Co.'s No. 1 E. S. Polling, Sec. 22, Blk. 2-Y	Set 6-in., 2,496 ft; S.D., 2,712 ft.
The Texas Company's No. 2 C. R. Garner	Drlg. 2,250 ft.
The Texas Company's No. 1 Chas. Kalka	Set 8-in at 2,098 ft.
Willis et al's No. 1 Burnett est., C SE SW NW, Sec. 111, Blk. 5	5,000,000 ft. gas at 2,888 ft. Running 6-in at 3,010 ft.

CASTRO COUNTY

Colorado O. & R. Co.'s No. 1 M. Slemmons, SW cor. Sec. 78, Blk. M-17, B. S. & F. Sur.	Rig blown down.
Mystery Oil Co.'s No. 1 J. I. Crum, SE cor. NE, Sec. 333, Blk. M-6, S. K. & K. Sur.	S.D., 510 ft. for casing.

CHILDRESS COUNTY

Hoover & Calloway's No. 1 O. L. Tucker, Sec. 736, Haggard Sur.	Spudded and S.D.
C. L. Sloane et al's No. 1 B. P. Smith, Sur. 49, F. P. Knott lands	Set 6-in. pipe, 2,902 ft; S.D., 3,600 ft.

COTTLE COUNTY

Exploration Co.'s No. 1 Richards	Spudded and S.D.

DALLAM COUNTY

Wood Bros. et al's No. 1 Capitol Synd., Sec. 19, Blk. 17	Hole full wtr., 4,007-4,127 ft; T.D., 4,188 ft; S.D. until spring.
Marland Oil Co.'s No. 1 A. M. James, C SW W ½, Sec. 21, S. H. McElreath Sur.	S.D., 2,445 ft. for wtr.
Marland Oil Co. et al's No. 1 Capitol Synd., Sec. 36, Blk. 18, Capitol Synd. land	U. R. 6-in. 3,450 ft.

DONLEY COUNTY

A. T. Drlg. Co.'s No. 1 F. E. Harrington, Sec. 39, Blk. 3-C	1,200 ft. wtr., 3,115-22 ft; show gas, 3,140-60 ft; dry G.W., 3,260-93 ft; S.D., 3,498 ft.

FLOYD COUNTY

Explin. Co.'s No. 1 S. H. Boone, C. C. H. Johnson Sur.	Spudded and S.D.
Explin. Co.'s No. 1 Land & Cattle Co.	S.D., 780 ft. for orders.
Hoffer Oil Corp.'s No. 1 Nelson	Spudded and S.D.

GRAY COUNTY

Archer Blake's No. 1 Turneaux, SW cor. Sec. 111, Blk. B-2	Drlg. water well.
Bay Shore Oil Co.'s No. 1 C. W. Bradford, Sec. 143, Blk. 2-B	T.D., 2,666 ft; S.L.M. shot with 10 qts. to loosen bit and 8-in collapsed; fishing.

(Continued on Page 143)

NORTH CENTRAL TEXAS DAILY AVERAGE PRODUCTION

Week ending December 17, 1927.

Ranger District

	Production
Brown County	17,843
Callahan County	4,104
Coleman County	1,053
Comanche County	1,450
Palo Pinto County	456
Ranger	8,236
Shackleford County	5,094
Stephens County	8,735
Total Ranger district	47,021

Wichita Falls District

Archer County	21,583
Baylor County	76
Clay County	548
Cooke County	4,848
Jack County	1,535
Montague County	9,664
Throckmorton County	1,137
Wichita County	27,490
Wilbarger County	10,112
Young County	11,689
Total Wichita Falls district	88,682
Total North Central Texas	135,703

Eastland Oil Co. and Chestnut & Smith opened up a new producing area in Coleman County last Friday night when their No. 2 Morris in the southeast corner of Lot 15 of the William Webber Survey came in flowing by heads from sand at 2,100-04 feet. The well caught fire but the first was extinguished within 24 hours. In 11 hours ending at 7 a. m. Monday morning it flowed 250 bbls. This test is about 6 miles northeast of Coleman. The pay is at about the same depth as that in the old Gwinnup Pool.

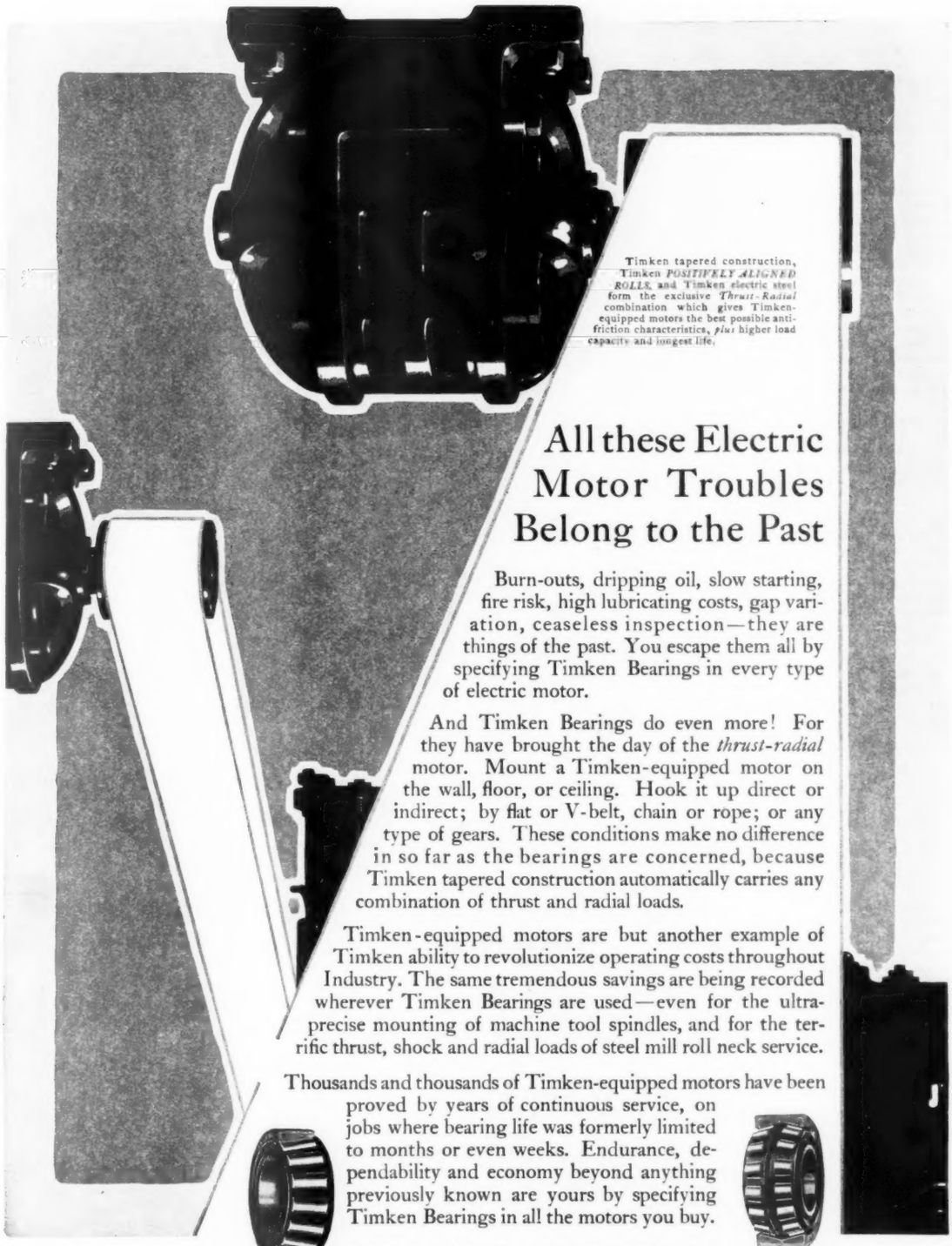
Magnolia Petroleum Co.'s No. 19 Morris in Section 728 of the David Breeding Survey, 9 miles north of Coleman, was drilled deeper to 2,252 feet and is now making about 60 bbls. daily. This is almost 2 miles west of other tests made by Magnolia in this district.

WICHITA FALLS DISTRICT

Foard County

Fain, McGaha and others' No. 1 Math-

(Continued on Page 138)



Timken tapered construction, Timken *POSITIVELY ALIGNED ROLLS* and Timken electric steel form the exclusive *Thrust-Radial* combination which gives Timken-equipped motors the best possible anti-friction characteristics, *plus* higher load capacity and longest life.

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Burn-outs, dripping oil, slow starting, fire risk, high lubricating costs, gap variation, ceaseless inspection—they are things of the past. You escape them all by specifying Timken Bearings in every type of electric motor.

And Timken Bearings do even more! For they have brought the day of the *thrust-radial* motor. Mount a Timken-equipped motor on the wall, floor, or ceiling. Hook it up direct or indirect; by flat or V-belt, chain or rope; or any type of gears. These conditions make no difference in so far as the bearings are concerned, because Timken tapered construction automatically carries any combination of thrust and radial loads.

Timken-equipped motors are but another example of Timken ability to revolutionize operating costs throughout Industry. The same tremendous savings are being recorded wherever Timken Bearings are used—even for the ultra-precise mounting of machine tool spindles, and for the terrific thrust, shock and radial loads of steel mill roll neck service.

Thousands and thousands of Timken-equipped motors have been proved by years of continuous service, on jobs where bearing life was formerly limited to months or even weeks. Endurance, dependability and economy beyond anything previously known are yours by specifying Timken Bearings in all the motors you buy.

SINGLE ROW TIMKEN BEARING

DOUBLE ROW SELF-CONTAINED TIMKEN BEARING

THE TIMKEN ROLLER BEARING CO.
CANTON, OHIO

TIMKEN *Tapered Roller* BEARINGS

Greater Seminole Continues Decline

Production Sunday Dropped to Lowest Point Recorded Since Last Summer. Another Showing in Logan County

By J. L. Dwyer
Staff Correspondent, Oklahoma Fields

Further declines in the Greater Seminole region, and reports of premiums being offered for this crude strengthened the Oklahoma market slightly last week. There is evidently some demand for Seminole crude for export, as the principal inquirers sought the oil for that purpose.

The completion of 12 additional wells in all pools of the Seminole Field failed to check the decline. There is slight chance for the field to again touch the 400,000-bbl. mark as long as the present plan of shutting in the threatening regions is in effect. The daily output of the Seminole territory has ranged below the 385,000-bbl. mark all week, and on Sunday and Monday of this week produced as follows:

Pool—	Sunday	Monday
Little River	39,407	38,240
Bowlegs	106,560	109,689
Earlsboro	144,261	146,199
Seminole	56,244	56,417
Searight	22,337	21,149
Total, from 1,049 wells	368,809	371,694

This is the lowest figure which the Greater Seminole pools have touched since early in the summer of 1927.

The movement of oil by pipe lines out of the field continues unchanged from last week, and the amount of oil shipped by tank cars has varied greatly through the week, although the daily average is still around 16,000 bbls.

Pipe Line Movement

The daily average movement of oil by pipe lines is as follows:

Barnsdall	3,988
Consolidated	656
Mid-Continent Petroleum Corp.	6,901
Empire	14,107
Gulf	29,659
Magnolia	35,608
Oklahoma	63,428
Ozark	16,082
Prairie	54,761
Pure	8,752
Shaffer	8,039
Sinclair	55,042
The Texas Company	23,442
Tidal	6,666
White Oak	1,830
Total	328,962

The completion of wells in this field during the past week was limited to small producers and swabbing wells, most of which were inside locations. A very interesting wildcat well is the Barnsdall Oil Co.'s No. 1 Holutke, in Section 22-7-6 3½ miles south of Little River. This well passed through the Simpson sand and is now drilling in lime at 4,258 feet, with the Wilcox sand expected any time. The well has been running very high.

There is a further decrease in the number of active operations in the Greater Seminole area, and the work is divided as follows:

Pool—	Locations	Rigs	Drilling
Little River	4	3	33
Bowlegs	4	2	47
Earlsboro	0	2	56
Seminole	1	0	2
Searight	1	0	12
Total	10	7	150

In western Oklahoma a new showing was found by Ramsey Brothers' No. 1 Smith, NE cor. SW Section 33-18-4w, in Logan County, where the Tonkawa sand was found from 4,119-4,121 feet, with one flow of 25 bbls. The hole is now standing with 1,000 feet of oil and a small showing of water. This well is in the vicinity of the Texas Pacific Coal & Oil Co.'s original well which touched the first oil production in the county.

Little River

Company, Farm—	Wells	Prod.
Amerada:		
Fore	2	1,370
Nitey	4	2,965
Barnsdall:		
Halutke	1	100
Blackwell:		
Nitey	8	4,860
Carter:		
Fish:	3	2,045
Continental:		
Cosar	2	845
Gypsy:		
Campbell	2	365
Nungee	1	80
Pottey	2	782
Wadsworth	2	42
Independent:		
Harris	1	108
Indian Territory:		
Campbell	1	210
Dugan	3	3,532
House, M. A.	1	483
House, W. E. "A"	1	56
House, W. E. "B"	3	2,267
Jackson	3	2,269
McCulla	3	1,188
Nitey	6	1,491
Phoebe, "A"	2	822
Phoebe "B"	1	1,262
Reed	1	113
Soketheche	4	1,237
Magnolia:		
Cruse	1	600
Mid-Continent:		
Wadsworth	7	1,506
Smith	1	50
Philmack:		
Davis	1	1,785
Prairie:		
Dungan	2	400
House	4	2,800
Roxana:		
Smith	1	32
Sinclair:		
Cosar	1	1,345
Superior:		
Wadsworth	1	10
Snowden-McSweeney:		
Tiger	1	300
Texas:		
Coker	3	700
Tidal:		
House	3	1,520
Johnson	1	70
Total		39,604

Bowlegs

Amerada:		
Rasco	8	3,465
Atlantic:		
Baker	4	810
Fleet	4	768
Grayson	2	1,461
Jones, A.	3	125
Jones, C.	2	561
Barnsdall:		
McNac	1	35
Murrow	4	904
Carter:		
Bowlegs	3	1,450
Burden	3	530
Harjoche	6	675
Hilly	2	815
Jones	3	3,200
McGeisey	1	
Melisse	1	1,475
Walker	3	625
Wise	12	7,610
Empire:		
Lacy	6	734
Wise	2	1,105
Gypsy:		
Bowlegs	1	317
Bradley	1	65
Brown	1	47
Cumsey	4	2,052
Dosar	1	100
Grayson	4	1,985
Harjoche	1	1,360
Henderson	1	
Jones	1	677
Walker	2	2,710
Wise	3	325
Independent-Marland:		
Coker	1	
Indian Territory:		
Barnett	2	597
Billington	5	952
Bowlegs	11	1,146
Burden	1	
Davis	4	1,969
Fay	6	4,541
Goforth	11	2,114
Hull	1	167
Livingston	11	5,225
Lizzie	2	887
Walker	8	1,184
Wilmont	4	1,404
Work	1	
Youngblood	2	431
Magnolia:		
Davis, B. F.	1	782
Davis, M.	1	620
Hammond	2	16
Rhoades	3	346
Van Buskirk	1	
McCulloch:		
Bowlegs	3	240
Mid-Continent:		
Baker	4	2,375
Bowlegs	1	135
Hutke	1	2
Smith	4	1,015
Minnehoma:		
Bowlegs	3	215
Prairie:		
Gahagan	4	1,175
Harber	8	4,665
Jones	3	1,210
Templeton	4	4,625
Whitney	4	500
Pure:		
Reed	15	5,442
Strothers "D"	3	832
Strothers "E"	1	5
Strothers "F"	2	1,033
Roxana & Houston:		
Taylor	6	1,597
Shaffer:		
Lacy	3	612
Sinclair:		
Bowlegs	1	
Cumsey	2	4,590
Elen	6	2,781
Harjo	3	1,140
Jones	6	6,636
Taylor	4	4,453
Walker	4	1,145
Texas:		
Reed	9	3,865
Tidal:		
Grayson	3	1,530
Harjoche	6	2,510
Twin Sates:		
Jones	2	20
Total Bowlegs	287	112,765

Earlsboro

Amerada:		
Anderson	3	45
Cowden	8	2,290
Rodgers	3	2,640
Barnsdall:		
Brown	4	3,228
Bruner, F	2	60
Bruner, N.	4	1,347
Cudjo, C.	1	27
Davis, D.	3	2,754
Davis, J.	4	1,385
Davis, M.	3	2,786
Gibson	7	1,964
Hearn	1	7
Ingram	7	6,340
Pack	4	194
Peter	4	430
Sango	3	1,127
Sebolka	1	889
Sullivan, H	2	127
Sullivan, Harjo	3	71
Wasutke	4	978
Carter:		
Davis	1	1,010
Payne	3	980
Sango	3	7,455
Continental:		
Kays	2	615
Spencer	4	2,210
Crosbie:		
Bryant	2	500
Empire:		
Barker	1	3,502
Edmundson	3	1,589
Gypsy:		
Bruner	4	4,885
Carter	10	6,547
Earl	1	
Hunick	1	122
Nolle	4	5,702
Peter	6	25
Sango	4	9,956
State	4	952
Independent:		
Bruner	4	396
Sullivan	4	36
Knapp	5	3,717
Gaines	2	788
O'Dell	4	130
Inter-Ocean:		
Payne	1	26
Magnolia:		
Bryant	6	2,412
Cowden	4	73
Dixon	1	38
Edmundson	3	16
Holmsley	8	7,167
Ingram	1	33
Lena	2	96
Seay	8	1,718
Simpson	4	334
Sparks	7	3,322
Sullivan	3	1,195
Mid-Continent:		
McCumber	7	1,535
Mid-Kansas:		
Anderson	4	424
Phillips:		
Dunnaway	1	27
Graham	7	20
Prairie:		
Baker	1	50
Davis	4	1,344
Graham, C.	2	710
Graham, O	4	2,165
Stidham	13	7,130
Roxana:		
Bayliss	1	17
Spencer	2	2,143
Shaffer:		
Clark	4	1,483
Sinclair:		
Foreman	1	15
Hollins	3	510
Sango	1	6,130
Skelly:		
Spencer	2	1,948
Texas:		
Anderson	6	1,705
Brown	8	2,015
Rodgers	3	6,335
Wilmont	6	2,195
Tidal:		
Watkins	6	1,985
Twin State:		
Barker	4	250
Hearn	3	9,420
Total Earlsboro	285	145,788

Seminole

Carter:		
B. Carter	2	200
J. Carter	3	25
F. Carter	3	120
Creamer	2	23
R. Cudjo	4	425
W. Cudjo	2	17
Gilliland	2	390
Grisso, M.	1	25
Grisso, W.	5	1,150
Jackson	1	35
Knapp	3	150
Killing, M.	12	8,400
Killing, G.	4	725
Lukes	7	1,505
Ponder	2	70
Simpson	3	140
Strother	4	525
Vierson	3	280

OPERATIONS SLUMP IN MEXICO WITH BIG DECLINE IN VESSEL SHIPMENTS

By George Blardone
Staff Correspondent, Mexican Fields

TAMPICO, Mex., Dec. 18.—That the petroleum industry in Mexico is in the doldrums—to borrow a nautical expression—is best illustrated by the figures of the November field operations in this the Tampico-Tuxpam embayment. In sum: there were 20 wells completed; there were four producers—and the new production resulting as exactly 400 bbls. Nor was there any encouraging news from the few tests drilling in the other parts of the republic; and an oil strike, even more than a discovery of precious metals, does not easily conceal itself. It is too spectacular.

Reduced to a table the last four months in this the Tampico-Tuxpam district is approximately as follows:

August: wells completed, 46; producers, 5; new production, 9,700 bbls.

September: wells completed, 26; producers, 5; new production, 14,425 bbls.

October, wells completed, 27; producers, 3; new production, 25,350 bbls.

November, wells completed 20, producers, 4; new production, 400 bbls.

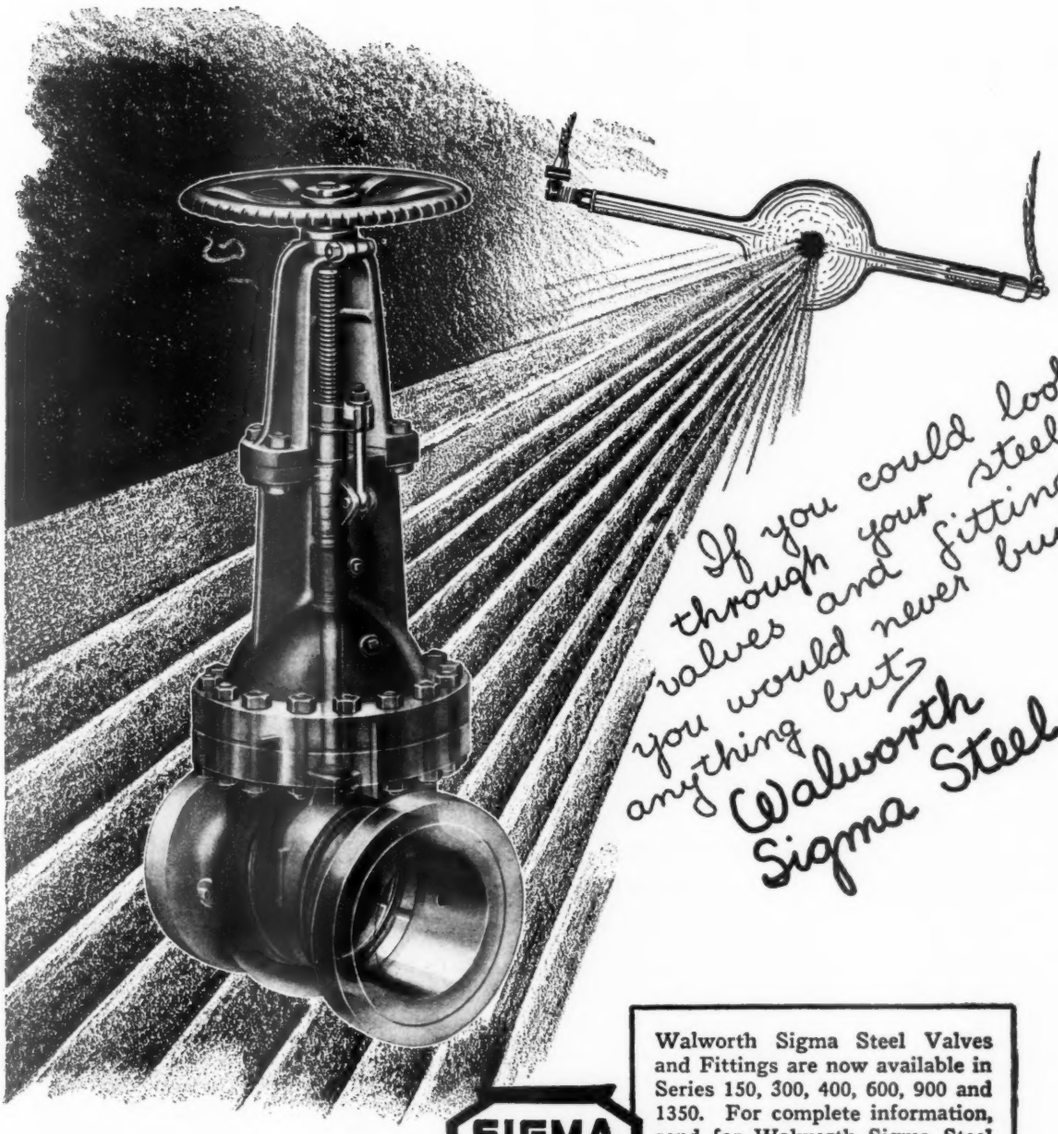
The above sums 119 completions in the 4 months in question, with 17 producers. Of these 17 producers, three wells are rated at 35,000 bbls., (Penn Mex Fuel Co.'s completions in the Paso Real sector of the south fields, south of the Tuxpam River), and 13 wells in the northern fields (heavy oil district) can be credited with 14,825 bbls of new production. (There was one 50-bbl. well in the south fields, which is noted to balance the total number of completions.)

There is something a trifle less than 50 strings of tools making hole, or say, rigging and making ready to make hole, at this writing. The one or two wildcats that were drilled to completion during the four months under discussion were failures.

Of the total of 119 wells finished in the period noted, 103 belonged to the northern district and 26 belonged to the south.

The effect on vessel shipments (exports) was noticeable in short order. August and September kept up in the 4,000,000 bbl. mark, but October dropped below the 4,000,000 curve, the first time, under normal shipping conditions, since early 1918. November shipping has not yet been fully compiled, but it cannot better, except, possibly in an academic way, the October movement.

The above sums actual conditions. Suffice it that operators, large and small, while watching the trend of the times, politically speaking, with a weather eye are inclined to view the coming of the new year with more optimism than has been apprent for quite some time.



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Amerada:		
Fixico	4	1,192
Killing	4	473
Rentie	5	657
Atlantic:		
Cudjo, N.	3	620
Barnsdall:		
Carter	8	1,860
Henry	2	565
Jones	4	1,095
Empire:		
Gross	3	195
Wilson	2	408
Gypsy:		
Butler	3	742
Carter	8	295
Cudjo	5	367
Fixico	7	120
Harjo	3	720
Wolf	6	135
Independent:		
P. Fixico	3	345
Harjo	3	600
Independent & Garland:		
Fixico	8	611
Independent & Interocean:		
Jones	4	382
Indian Territory:		
Allen	2	65
Bowlegs	12	2,361
Fleet	1	11
Gooden	4	194
Harjo	4	228
James	4	201
Reed	3	29
Kingwood:		
Johnson	3	1,221
Magnolia:		
Born	1	28
Franks	4	940
Mid-Continent:		
Rentie	9	1,110
Tayeche	7	380
Mid-Kansas:		
Wilkins	1	214
Phillips:		
Strothers	2	150
Philmack:		
Butler	3	1,370
Prairie:		
Gross	5	105
Mason	1	105
Spencer	1	10
Strother	8	1,315
Pure:		
Strother, A.	17	3,154
Strother, B.	5	1,736
Strother, C.	1	26
Roxana:		
Harber	2	351
Lashley	2	25
Sinclair:		
Carter	2	28
Cudjo, A	6	960
Cudjo, B.	4	1,020
Dicey	2	1,490
Fixico	4	330
Slick:		
Cudjo	3	634
Franks	8	1,389
Giblet, Sam	3	2,398
Tiger	1	41
Superior:		
Cudjo	4	589
Texas:		
Mayhue	1	310
Strothers	2	45
Tidal:		
Carter	4	711
Fixico	6	570
Harjo, D.	3	795
Harjo, T.	6	240
Mahardy	2	169
Turman:		
Cudjo	4	1,076
Grisso	1	126
Jones	4	1,187
Total	319	55,124
Searight		
Carter:		
Davis	7	1,405
Frazier	6	4,440
Johnson	1	.....
Kiker	1	30
Mandler	2	45
Scott	1	30
Amerada:		
Johnson	1	60
Strother	2	1,785
Gypsy:		
Cudjo	4	645
Mid-Continent:		
Grayson	6	145
Soloche	3	1,495
Pine:		
Lulla	1	.....
Prairie:		
Cannon	1	10
Carter	1	25
Houck	1	5
K'neaid	5	80
Wiemer	1	15
Superior:		
Harris	1	75
Pure:		
Aldridge	6	4,114
Roxana:		
Strother	3	1,555
Sinclair:		
Polly	4	2,625
Texas:		
Fleet	1	50
Twin State:		
Varnum	2	468
Wilcox:		
Chupco	8	3,312
Total	69	22,414
Total Little River	85	39,604
Total Bowlegs	287	112,709
Total Earlsboro	285	145,788
Total Seminole	319	55,124
Total Searight	69	22,414
Grand Total	1,046	375,639

Cimmarron County

Gladys Belle Oil Co's No. 1 Israel, SW cor. NE, Section 25-3-7ecm, has been abandoned at 4,392 feet.

Carter County

Schermerhorn and others' rig is being erected for No. 1 Crockett, NE cor. NW SW, Section 23-1s-3w. Humble Oil & Refining Co. is building the rig for No. 3 Spears, SW cor. NE NW, Section 29-1s-3w. Wirt Franklin Petroleum Corp. is building the rig for No. 2 Bumpass, NW cor. SW SE, Section 33-1s-3w

Magnolia Petroleum Co.'s No. 8 J. J. Hardin, NE cor. NW, Section 19 1s-3w, lost the hole at 2,800 feet and has been abandoned. No. 1 Anderson, NW cor. NE NW, Section 23-1s-3w, made 100 bbls. on the pump from 2,343 feet to 2,485 feet. No. 2 M. Morris, SW cor. SE NE, Section 21-2s-3w, was completed for 15 bbls. in sands at 2,233-61 feet and 2,261-70 feet. No. 1 Simpson, NW cor. NE NW, Section 33-4s-1w.

Creek County

Transcontinental Oil Co. has the rig on the ground for No. 4 Freeman, SW cor. SE SW, Section 14-17-8. Drew Oil Co.'s No. 1-A Miller, NW cor. SE, Section 32 18-11, had the Red Fork sand at 1,609-43 feet and made 15 bbls. when shot with 40 quarts. Ted Ray Oil Co.'s No. 2 Smiles, NW cor. NE NE, Section 13-17-10, was completed for 30 bbls. in the Red Fork sand at 1,887-1,909 feet. Curtis Oil Co.'s No. 2 Rhea, NE cor. SW SE, Section 23-16-10, is dry and abandoned at 3,085 feet.

Grady County

Carter Oil Co. is building a rig to deepen No. 1 McCaughtry, NE cor SE NW, Section 26-5-8w. The depth now is 1,319 feet. H. A. Milleur and others' rig is up for No. 1-A Milleur, CWL E half SE SE, Section 23-4-8w. Galton Camp (trustee) is rigging up No. 1 Soloman, SW cor. Section 25-4-8w.

Stogner and others' No. 10 McCaughtry, SE cor. NE, Section 23-5-8w, has been shut in for 66,000,000 feet of gas in sand at 2,031-69 feet. Oklahoma Gas Utilities' No. 2 Heathley, NW cor. NE, Section 2-4-8w, was completed for 40,000,000 feet of gas in sand at 2,154 2,400 feet. Carter Oil Co.'s No. 4 Scharmack, NE cor. SW SW, Section 35-3-5w, Carter-Knox area, is swabbing 40 bbls from sand at 1,507-25 feet.

Kay County

Marland Oil Co. is rigging up a machine for No. 3-A Dickerson, CEL W half NW SE, Section 17-29-1e. Wentz Oil Corp. is moving in a machine for No. 2 Blackwell Country Club, SE cor. SW SW, Section 20-27-1w.

Harris & Haun's No. 1 Bechtel, C NW SE, Section 22 29-1w, North Braman Pool, is an abandoned location. Vernon Oil & Gas Co.'s No. 4 Brockhouser, SE cor. SW SE, Section 17-29-1e, has been abanodend at 3,537 feet. Blackwell Oil & Gas Co.'s No. 11 Nix, NE cor. SE, Section 18-28-1e, is dry and abandoned at 3,842 feet. Harris & Haun's No. 3 Brown, C SE SW, Section 9-27-1w, has been put on the pump and is making 15 bbls Wentz Oil Corp.'s No. 1 Blackwell Country Club, SW cor. Section 20-27-1w, was completed for 1,940,000 feet of gas in sand at 692-97 feet.

Lincoln County

Shaffer Oil & Refining Co.'s No. 1-A Skinner, SE cor. SW SE, Section 31-17-5, had an initial production of 865 bbls. from sand at 4,248-89 feet.

Logan County

Wirt Franklin has the rig on the ground for No. 1 Knecht, NW cor. Section 21-18-4w, Lovell area. Roxana Petroleum Corp. has the rig material on the ground for No. 2 McCully, SE cor. Section 30-19-4w.

Ramsey Brothers' No. 1 Gragg, SW cor. SE NE, Section 16-18-4w, is making 89 bbls. from the Tonkawa sand at 4,072 85 feet.

Muskogee County

J. A. Evans and others' machine is at the location for No. 1 H. Thompson, SW cor. NW SW, Section 2-14-19. Link Oil Co.'s No. 2 Austin, CEL SE NE, Section 32-15-15, is dry and abandoned at 2,194 feet.

Okmulgee County

W. F. Epler's No. 1 Graham, SW cor. NE NE, Section 22-15-11, is drilling at 1,000 feet. E. P. Jones and others moved a machine out for No. 2 J. Jones, C SW NE, Section 14-14-13. W. B Pine has a machine at the location for No. 4 A. Byrd, SW cor. NE SE, Section 27-14-13.

Sunray Oil Corp.'s No. 1 Cooper, NE cor. NW, Section 36-16-13, was completed for 5,000,000 feet of gas in the Dutcher sand at 1,624-33 feet. Eagle Picher Lead Co.'s No. 1 Bird, NW cor. NE, Section 5-12-12, has been completed for 2,000,000 feet of gas in sand at 2,289-96 feet. Riney & Williams' No. 2 Love, SE cor. SW, Section 9-14-14, had sand at 1,626-38 feet and is making 5,000,000 feet of gas. F. Henthorn's No. 6 Rentie, NE cor. SW NE, Section 18-14-15, has been abandoned at 1,300 feet. A. Shelton's No. 2 S. Simer, NW cor. SW, Section 32-13-14, was completed for 8 bbls. in sand at 1,183-1,210 feet.

Osage County

Kewanee Oil & Gas Co. has the rig on the ground for No. 11, SW cor. SE NW, Section 34-27-6, Burbank Pool. The rig has also been moved out for No. 12, NE cor. SW NW, Section 34-27-6. Oklahoma Natural Gas Corp. has a machine on the ground for No. 779, SW cor. NE, Section 33-21-12.

Kewanee Oil & Gas Co.'s No 10, NW cor. SE NW, Section 34-27-6, Burbank Pool, was shot with 100 quarts and is producing 175 bbls. from Burbank sand at 2,846-2,921 feet. No. 5, NE cor. SE SW, Section 34-27-6, had Burbank sand at 2,746-2,812 feet and made 347 bbls. naturally and 505 bbls. after the shot. Indian Territory Illuminating Oil Co.'s No. 387, SW cor. NE NE, Section 17-27-11, is a gas well making 1,000,000 feet from sand at 730-47 feet.

Okfuskee County

J. Burns' No. 3 Cinda, SE cor. SW NE, Section 12-12-10, is dry and abandoned in the Dutcher sand at 2,840-45 feet.

Pawnee County

Privett Drilling Co. made location for No. 1 Houston, SW cor. SE NE, Section 10-20-6.

Pontotoc County

LaSalle and others' rig is up for No. 3 Copeland, NE cor. SW, Section 28-5-5. Louisiana Oil Refining Co.'s No. 4 Harjo, SE cor. NE SW, Section 17-5-8, made 200 bbls. from sand at 2,423-66 feet. Jack Kilgore's No. 1 L. Smith, NW cor. NE, Section 29-5-8, is making 8 bbls. from 2,685 feet after plugging back from 2,707 feet.

Stephens County

Clark & Cowden have the rig up for No. 1 Davidson, NE cor. NW SW, Section 13-1s 4w. Empire Gas & Fuel Co.'s No 9 Cantrill, CWL E half SE SE, Section 32-1s-8w, is drilling deeper at 1,750 feet. George Pace and others' No. 1 Allen, CNL NW NE, Section 3-2s-8w, is rigging up rotary tools. Owen & Wood's No. 8 Massey, SW cor. SE NW, Section 12-2s-8w, is cementing surface pipe.

Tulsa County

Glidden Oil Corp.'s machine is at the location for No. 1 Jones, C NE NE, Section 15-19-11. The rig is up for No. 1 Combs, SW cor. NW SE NW, Section 23-19-11. Savoy Oil Co.'s No. 2 Scott, NE cor. SE NE SW, Section 8-16-14, is spudding. Burk-Gibbs Oil Co. has the rig up for No. 1 Scott, NW cor. NE NE, Section 17-16-14.

Lockwood and others' No. 1 Fife, NW cor. SW SW SE, Section 15-19-11, made 75 bbls. after shooting 100 quarts in the Hominy sand at 2,198-2,227 feet. Anadarko Western Oil Co.'s No. 1 Hodge, NW cor. NE NW SW, Section 33-19-11, is dry and abandoned at 2,630 feet. Glidden Oil Co.'s No. 1-A Wray, SW cor. NW, Section 35-19-13, was completed for 250,000 feet of gas in sand at 1,937-49 feet. Minshall Oil & Gas Co.'s No. 3 Bruner, NW cor. NE NE, Section 9-18-13, is a dry hole at 1,679 feet.

Hughes County

Independent Oil & Gas Co.'s No. 5 Irving, SE cor. Section 18-8-10, drilled Wilcox sand from 4,013 feet to 4,025 feet and was plugged back to the Hunton lime at 3,840 feet where it is making 4,000,000 feet of gas and 20 bbls. oil daily.

Wagoner County

R. F. Winters' No. 1 Bilby, NE cor. SE SW, Section 1-19-15, is dry and abandoned at 2,704 feet. John H. Stryker's No. 2 Letterman, NE cor. SW SE, Section 19-18-16, has been abandoned at 980 feet. Stryker & Welch's No. 5 Sinkler, NW cor. SE, Section 19-18-16, is dry and abandoned at 820 feet. H. D. McCracken's No. 4 Hosmer, NE cor.

(Continued on Page 119)

OXFORD TOWNSITE POOL FURNISHES BEST KANSAS WELL IN MONTHS

By J. L. Dwyer
Staff Correspondent, Kansas Fields

The Oxford townsite pool of Sumner County furnished the best well to be completed in many months in Kansas. It is the Roxana Petroleum Corp.'s No. 4 Emerich in the townsite which covers part of Section 14-32-2. The new well made 3,250 bbls. after a shot of 100 quarts in sand 1,994-2,095 feet. Another good producer in the same pool was the Roxana's No. 1 Rockwell, which made 1,585 bbls. after a shot of 140 quarts in sand 2,018-88 feet.

There was an increase of approximately 5,000 bbls. in new production from nine wells in Kansas last week, the best sign of life which that region has evidenced in many months. The Oxford Pool is now producing 9,000 bbls. from 27 wells.

Butler County

Davis and others have the rig up for No. 3 Lewis, NW cor. SW SW, Section 3-27-6. Rosenthal and others' rig is up for No. 8 Shaffer, NE cor. SE SE, Section 4-27-6. Richmond Drilling Co. has erected the rig for No. 1 Getter, NE cor. SW, Section 17-27-6. Blaksley & Wentz' No. 1 Henry, NW cor. SW, Section 21-27-6, an old well, is rigging up to deepen from 2,810 feet.

Mathews, Ralston and others' No. 1 Doughty, SE cor. NE SE, Section 6 27-6, has been completed for 40 bbls. in sand at 3,108-14 feet. Luett & Sheets' No. 1 Jones, SW cor. NE, Section 30-28-7, has been abandoned at 2,839 feet.

Chase County

Kewanee Oil & Gas Co.'s No. 2 Lipps, C NW NW, Section 36-18-6, had sand at 1,162-92 feet and is shut in for 1,000,000 feet of gas.

Coffey County

Bruce, Bradley & Gore moved a machine out for No. 1 Reed, NW cor. SW SW, Section 23-22-13.

Cowley County

Kentucky N. & O Co. has a machine on the location for No. 1 Dobson, SE cor. NE, Section 24-33-6, to drill for helium gas.

Brinn and others' No. 1 Hughes, NW cor. SW, Section 20 31-4, is dry and abandoned at 3,352 feet.

Elk County

Jacqueline Oil Co. made location for No. 2 Hawkins, NE cor. NW SE, Section 34-29-12. Theta Oil Co.'s No. 3 Marshall, SW cor. SE SE, Section 27-31-10, is drilling at 700 feet.

Jacqueline Oil Co.'s No. 1 Hawkins, NW cor. SE, Section 34-29-12, was shot with 60 quarts and is maging 10 bbls. from sand at 826-42 feet Phoenix Oil Co.'s No. 1 Hawks, NE cor. Section 22-30-10, is a 20 bbl. well in sand at 1,988-2,014 feet. Union Gas Corp.'s No. 1 Glasscock, C SW NE, Section 11-31-10, is a dry hole at 1,469 feet. Griffeth, Bell and others' No. 1 Cunningham, NW cor. Section 35-31-10, had sand at 2,293-95 feet and is making 5 bbls. Roth & Faurot's No. 1 Elk Bank, NW cor. SW, Section 3-31-11, is dry and abandoned at 2,338 feet.

Greenwood County

Theta Oil Co.'s rig for No. 3 Fankhouser, SE cor. SW SE, Section 23-22-11, is under construction. Empire Oil & Refining Co. has erected the rig for No 5 Schwab, NE cor. SE NE, Section 25-22-12. Rhodes & Empire Oil & Refining Co. has a machine at the location for No. 1 Wasson, NE cor. Section 27-22-12. Darby Petroleum Co. has built

(Continued on Page 118)

Hot Oil Pump PERFECTION

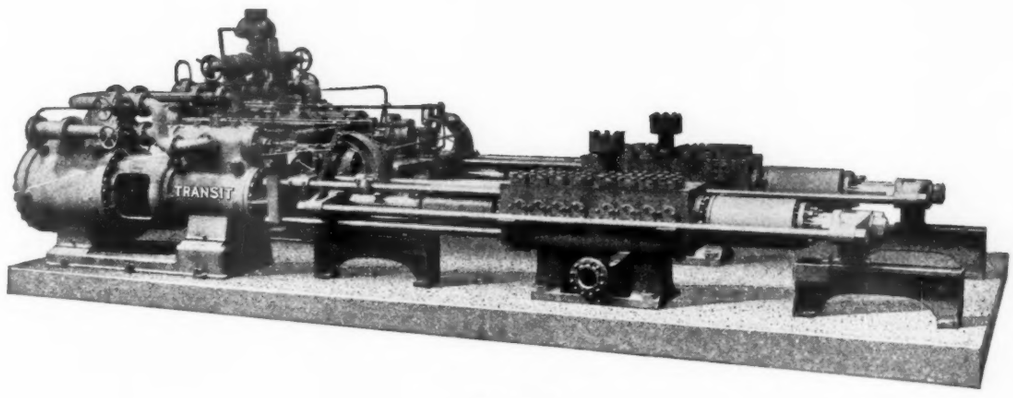

Fig. 1805.

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Few Completions in Louisiana Area

Sharp Slump During Past Week Preceding Holiday Lull. Interesting Gas Test in Champagnolle District, Arkansas

By D. H. Bancroft
Staff Correspondent, North Louisiana-Arkansas

SHREVEPORT, La., Dec. 19.—Palmer Corp.'s No. 1 White in Section 2-19-10, West Carroll Parish, a wildcat 35 miles from nearest production in the Monroe and Richland Parish gas fields, after being drilled in, slopped over the casing. With the bottom at 2,466 feet it was 16 feet in what is given out as the Monroe gas rock—probably the second sand—and two weeks ago developed a pronounced show of gas. Six-inch casing was cemented at 2,406 feet and drilling in delayed beyond the usual cementing time. Then it was drilled in but before bailing had progressed any length of time the well started slopping over the top of the casing—or rather the christmas tree. It was shut in immediately.

More Pipe Line Plans

In this connection, the latest report on the proposed Richland-Monroe-St. Louis gas line is that the Palmer Corp., Moody-Seagraves interests and the Interstate Gas Co. will combine to build it. Moody-Seagraves came out three weeks ago with confirmation of rumors they were planning a 24-inch line to St. Louis. Interstate Gas Co. and Interstate Pipe Line Co. have a 22-inch line from the Monroe Field to Baton Rouge with a 16-inch extension to New Orleans about completed. Palmer Corp. has been figuring on a line to St. Louis for some time, but has consistently declined to confirm these reports, preferring to wait until all preliminary negotiations have progressed beyond the chance of any miscarriage of plans from any cause whatever.

Meanwhile, Belchic & Laskey, also operating as the Northwest Louisiana Gas Co., with production, pipe lines and franchises throughout the northwest quarter of Louisiana, announce they are figuring on a major pipe line project to serve southwestern Louisiana cities with gas from the Monroe, Richland and northern Webster Parish fields. At present, according to Mr. Belchic, the project is confined to preliminary surveys as to markets to be served, route of right of way, franchises, construction costs, etc., with all their many ramifications. It is highly probable, however, that the line will be built, Mr. Belchic stating it will probably be three or four months before they make up their mind.

With Ruston as a base, the pipe line, if built, will go through or near Winnfield to Bunkie, LaFayette, Crowley and Jennings to Lake Charles, circling back north up the Louisiana-Texas state line to DeRidder and Leesville, in all something in the neighborhood of 300 miles, and, with the population to be served, requiring a 16 to 20 or 22-inch pipe. If built it will be the Monroe Field's fifth or sixth outlet and the Richland Parish field's fourth.

Fewer Completions

The completions record for the North Louisiana-East Texas and Arkansas territory displayed a sharp slump from the week before with indications it will continue low during the holiday period and then take a sharp curve upward. Everybody drilling a well just now is trying to reach casing seat and cement so that the holiday lay-off will not mean any loss of drilling time, the result of which will be a long list of completions during the first two weeks of the new year.

With 12 completions, two of them abandoned structure tests in northwest Caddo, it was distinctly another gas week, gas wells having predominated in Shreveport territory for the past six weeks or two months. Of the remaining 10 completions, 6 were gassers, 1 a small producer in Marion County, Texas, and 3 were failures. The gassers had an initial open flow of 158,000,000 feet. Three of these were in Richland Parish and of these two were well up to the standard set by their immediate predecessors. Moody-Seagraves' No. 1-B Hemler in Section 20-16-6 was completed at 2,440 feet with 49,460,000 feet; Natural Gas & Fuel Corp.'s No. 2-B Sartor in Section 19-16-6 gauged 61,753,232 feet, total depth 2,445 feet, and Moody-Seagraves' No. 1 McClanahan in Section 36-16-5 gauged 36,250,000 feet of gas from 10 feet of sand to the comparatively short list of recent failures in Richland when it abandoned No. 1 Delta Hardwood Co. in Section 22-16-7, as a dry hole at 3,020 feet.

In the Morehouse Parish division of Monroe gas field Natural Gas Products Co. completed No. 10 Tensas Delta Section 27-22-4, making 3,000,000 feet of gas, total depth 2,234 feet. With initial rock pressure of 1,040 pounds, the well is in one of the high pressure zones of the field and shows one of the highest pressures rocked up by recent completions.

Although it has two or three wells all but listed as completions—in the Champagnolle district of Union County, Arkansas was able to show but one completion, and it a salt water test on second completion of No. 8 Hayes in Section 4-16-15, Ouachita County (Smackover), by Lion Oil & Refining Co. A 5,000,000-foot gasser at 2,622 feet last May 30, the well was deepened to 2,677 feet, where it tested salt water, cemented back to 2,200 feet and milled out to test the Meakin sand at 2,265 feet and tested salt water again.

In East Texas the Marion County extension of the Trees City producing district of Caddo Parish registered completion by William Gross and others of their No. 1 Baker on the John French Survey pumping 5 bbls. from 2,391 feet. The Waskom gas district in Harrison County shows completion by J. R. Bahan of No. 3 Hickman on the E. Pollock Survey, making 3,000,000 feet of gas at 900 feet after plugging back from 2,950 feet, where it was dry. State Line Oil & Gas Co. abandoned No. 2 Mullins on the T. D. Wilson Survey after a salt water test at 996 feet. Salt water encroachment appears to be getting worse in Waskom shallow sand. In Panola County, Bethany Oil & Gas Co. got an estimated 4,000,000 feet of gas at 960 feet in No. 3 Burns on the W. A. Birdsong Survey.

Gas in Champagnolle

Quite the most interesting news that has come out of the Champagnolle Pool in northeastern Union County, Arkansas, is a test of 25,000,000 feet of gas in Ohio Oil Co.'s No. 1 R. Pumphrey in Section 1-17-14 at 3,030 feet with sand topped at 3,027 feet. It is probable, however, that it will be mudded off and drilled deeper as experience with Eddie Jones' No. 1 Crain in Section 2-17-14 and other wells in the pool which have shown large initial gas has been that the gas doesn't last long. For instance Jones' well, which had 30,000,000 feet of gas initial, with its 3,000 bbls. of 70 per cent water fluid three weeks ago, has dropped down to the same amount of fluid with 80 per cent water and 3,000,000 feet of gas. Ohio's No. 5 Crain in Section 1-17-14 bailed dry after a show of oil in 12 feet of sand from 3,034-46 feet and is going deeper. No. 1 W. Pumphrey in Section 1-17-14 tested salt water in 5 feet of sand, 3,012-17 feet, and likewise is going deeper. No. 3 Crain in the same section is standing 2,300 feet in oil from 8 feet in sand, 2,988-96 feet, but will not flow and will be standardized.

Production Off 1,290 Bbls.

Daily average runs from the field by all pools in the Shreveport group fell off 1,270 bbls. more to a total of 142,470 bbls., of which North Louisiana furnished 47,225 bbls., 395 less than last week, and Arkansas 95,245 bbls., a decline of 875 bbls. Some of the light oil pools showed increased runs, El Dorado leading the list with an increase of 445 bbls. to a daily movement of 6,520 bbls. De Soto-Red River runs increased 100 bbls. to 4,210 per day, Bellevue shipped 115 bbls. more than last week, Urania gained 15 bbls., and Elm Grove 40. Caddo light oil runs dropped 315 bbls. to 11,740 per day, Smackover light fell off 125, and Smackover heavy oil movement was 880 bbls. less than last week. Nevada County's decline from its peak shipment of something over 3,900 bbls. per day reached three weeks ago was added to by a further shrinkage of 300 bbls. during the week just closed. Daily average runs from the field by each pool for the week just closed were the following:

Caddo, light	11,740
Caddo, heavy	3,970
Homer	4,565
Haynesville	6,775
Red River-De Soto	4,210
Elm Grove	660
Bellevue	1,175
Cotton Valley	4,880
Urania	8,520
Pleasant Hill	730
Total Louisiana	47,225
El Dorado	6,520
Smackover, light	9,175
Smackover, heavy	72,465
Stephens	1,160
Nevada County	3,150
Lisbon	2,650
Bradley	125
Total Arkansas	95,245
Both States	142,470

NORTH LOUISIANA

Bossier Parish

Bellevue: Humble Oil & Refining Co.'s deep test, No. 30 Bliss & Weatherbee, in Section 15-19-11, is the only well drilling in this pool. It is down 4,621 feet and going deeper.

Cartersville: Arkansas Natural Gas Co.'s No. 1 Barnett, Section 17-23-12, is drilling at 1,340 feet. Belchic & Laskey cemented 6-inch casing at 3,078 feet in No. 1 F. W. Roberson in Section 22-23-12. In Section 26-23-12, Magnolia Petroleum Co. is reaming to bottom to cement 8¼-inch casing at 3,057 feet.

(Continued on Page 114)

DE SOTO PARISH WILDCAT PUMPING HIGHER GRAVITY FROM LESSER DEPTH

By D. H. Bancroft

SHREVEPORT, La., Dec. 19.—Benson Oil Co. apparently has a good pumper in No. 1 Wolff in Section 3-10-13 DeSoto Parish, 10 miles northwest of Pleasant Hill, producing a slightly higher gravity oil than the Sabine Pool yields and from a lesser depth, though it is believed the sand is the same Pleasant Hill crude is around 41 gravity while samples of the Benson oil tested 43 gravity. The well is not listed as a completion but it is past the point where it could be a failure. It is swabbing and heading about 90 bbls. of oil per day, the heads coming at more frequent intervals as it grows older and is expected to flow when tubing is set with packer. It is producing from 12 feet of sand 2,996-3,008 feet. This is the same approximate depth at which the Huntley Syndicate completed its No. 1 Parsons in the same section in April, 1920. Practical completion of the well has led to some leasing in its vicinity, but as things are now a Homer or Smackover type gusher would not create any tremendous amount of excitement or trading. Louisiana Oil Refining Corp. has bought more or less stuff in the vicinity and other companies are in but there has been no grand rush for ground floor positions or offset acreage. After the holidays the situation will, no doubt, be different and considerable development of the new pool will follow.

Mississippi Well Improved

Thursday, Natural Gas & Fuel Corp., which completed No. 1 Rye in Section 22-15-17, Monroe County, Mississippi, on November 19 as a 3,000,000-foot gas well in 22 feet of broken sand, total depth 2,715 feet, shot the formation with 40 quarts of nitro, the well responding by doubling its output of dry gas. It seems to be a general impression that northeastern Mississippi will be the scene of considerable activity during the next year. What activity there has been in the State during the past year has been widely scattered and more commanding activities have directed attention elsewhere with the result that the territory has not been closely scouted. But with Ohio Oil Co., Gulf Refining Co., Dixie Oil Co., Standard Oil Co Benedum and Trees interests, Natural Gas & Fuel Corp. and a large number of independents and individuals having extensive holdings plus improvement in the overproduction situation is causing closer attention to be paid to what is going on in the State.

Because the northeastern corner of the State is the only locality that has produced definite results in either oil or gas in commercial quantities, it will be the center of the activity anticipated early in 1928, but Dixie Oil Co., which has been carrying on an extensive seismograph survey in the Gulf Coast counties, is reported to have located two or three salt domes and is expected to do some drilling in that part of the State also. As the week ends Bassfield Oil Co., drilling No. 1 Burkett in Section 14-6-18 Jeff Davis County, is reported having cored 2 feet of sand, 3,115-17 feet, the bottom of the core showing oil. The owners said this showing is the second the well has made.

Arkansas Wildcats

Arkansas wildcats were mildly interesting in two cases in particular. Johnson & Adams, who went back to their old No. 1 Southern Lumber Co. in Section 12-12-12 Bradley County, last week and drilled 6⅝-inch plug at 2,204 feet, reamed to the bottom and swabbed dry with no show in 3 feet of sand.

In Nevada County, McDonald and others set a short string of 6-inch casing at 2,195 feet in No. 1 Pelt, Section 9-15-22, tested salt water in 18 feet of sand and are drilling deeper. The broken formation in which the showing upon which the test was made was found is the same as that found by the Humble Oil & Refining Co. in their No. 1 Reed-Bodcaw in the same area, but considerably higher. The Humble's well made a pronounced show of oil, much stronger than McDonald's.

Lion Oil & Refining Co. tested dry in

(Continued on Page 113)

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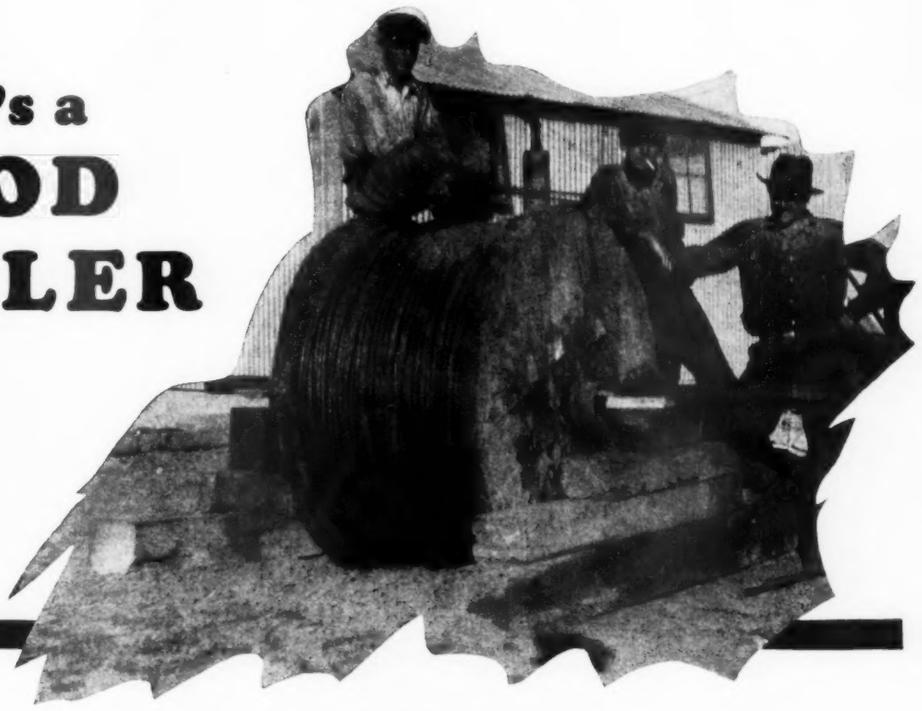

Left to Right:
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Texas Company Well Looks Promising

Indications Point to Its Being a Better Producer Than the Sun Oil Co.'s Well, of Which It Is an Offset in Dale Field

By B. D. Stevenson
Staff Correspondent, Southwest Texas

SAN ANTONIO, Tex., Dec. 19.—The holiday lull is still at the peak in Southwest Texas, with operations laying off "till after Christmas." Turkey and deer hunting still is engaging the attention of scouts and geologists. The last week was nearly devoid of interest in the proven fields, and with nothing to indicate anything that looks like a revival after the holidays, at least in proven territory. Somerset has not had a completion in weeks, Luling has only two wells drilling. The Texas Company has three wells on the sand at Dale and was completing one as the week closed and will complete the others the coming week. They are offsets to producing wells and add nothing of importance to the field except that in this field producing from the Serpentine an offset well may be very different from the well it offsets in volume of production. The Texas well offsetting the Sun's No. 2 Talley looks as though it will be a much better well than the Sun's.

In the Kingsville Field in Kleberg County Humble's No 4-A Dennett at 1,125 feet is the only well drilling and it is in extra hard formation and making slow progress. Geological speculation on this field is that wells drilled along a line northeast and southwest through this well get the formations extra hard and must be in or close to the fault line. Wells a little to the northwest of this line get the formations much softer and with more oil and no water. Wells in the line of this well are smaller. About 5 per cent water in one of them may be from casing failing to hold. At White Point and also in the Refugio Field the wells the last two weeks have made slight progress and some none at all.

Pipe Line Runs

Owing to the settled nature of the fields of Southwest Texas with little drilling to add initial flush production, pipe line runs from the proven fields of the district are almost at a standstill but showing a slight decrease from month to month.

Daily average runs from the Luling Field for November from 551 wells were 14,779 bbls. compared with 550 wells and daily average of 14,894 bbls. in October.

Daily average from the Lytton Springs Field not counting Dale, for November was 304 wells, 1,760 bbls., compared with 303 wells and daily average of 1,755 bbls. for October.

Daily average runs from Dale Field in November from 16 wells were 445 bbls. and in October from 11 wells, 385 bbls. daily.

Daily average runs from the Mirando district pools from a total of 672 wells were 7,042 bbls. for November compared with 670 wells and 7,369 bbls. for October.

Southton total runs for November were 5,192 bbls. compared with 5,302 in October and 5,299 in September.

Calliham total runs for the month of November were 1,900 bbls. compared with 1,979 bbls. in October and 2,238 bbls. in September.

Somerset runs were not all in as this was written, but the change will be slight from a total of 56,403 in October.

COMPLETIONS

Duval County

Robert Driscol:'s No. 8 Driscoll (fee), Survey 23, Duval County, at 2,437-39 feet gauged 40,000,000 feet of wet gas with 900 pounds rock pressure.

Houston Oil Co.'s (Texas) No. 2 S. Benavides, Cole Pool, corner Blocks 337, 338, 343, 344, at 1,553 feet gauged 30,000,000 feet of gas.

Medina County

Southern Gas Utilities-Witherspoon Oil Co.'s No. 4 Adams, (Southern's No. 20) Adams gas field at 958 feet in sand topped at 946 feet gauged 2,500,000 feet with 368 pounds rock pressure.

Jim Hogg County

O. W. Killam's No. 1 Canales, A. Canales tract, San Antonio Baluarto grant, has been abandoned dry at 3,070 feet.

McMullen County

Houston Gulf Gas Co.'s No. 2 Fisher, 600 feet west of Frio River has been abandoned dry at 2,940 feet.

Refugio County

William F. Morgan, Inc.'s No. 8 Lambert, in the Refugio gas field, Survey 8, location, has been abandoned.

Webb County

Cole Petroleum Co.'s No. 36 Benavides, discovery well in Survey 412, Block 14, has been junked and abandoned at 5,525 feet.

Zapata County

O. W. Killam's No. 1 Benavides, Survey 12, Block 13, has been abandoned dry at 1,605 feet.

New Locations

Milo E. Trussell's No. 1 Moody, Survey 60, Government Hill Field, Duval County, is drilling at 600 feet.

J. K. Young and B. W. Owens' No. 1 Ed Jones, is location 9 miles west of Bastrop and is moving in. (Bastrop County).

James O'Hara's No. 1 Pritchett, 7 miles east of Bastrop, will open old Pritchett well and resume drilling about middle of January.

Magnolia Petroleum Co.'s No. 3 McKinney, J. Henry Survey in the Luling Field in Caldwell, is drilling at 1,725 feet.

Houston Oil Co.'s No. 2 Brown Land & Cattle Co. is location in Live Oak County and is drilling at 636 feet.

Houston Gulf Gas Co.'s No. 1 Lark, McMullen County, is spudding in.

Alamo Drilling Co.'s No. 1 Gallagher, Nueces County, is moving in 10 miles southwest of Corpus Christi on the old Brownsville road.

Saxet Oil Co.'s No. 3 Meaney, Nueces County, has set casing at 2,322 feet.

Perry, Reed & LaPrelle's No. 1 Cochran, is location in Nueces County.

Perry and others' No. 1 State Land, Nueces County, is setting 10-inch casing at 468 feet.

Houston Gulf Gas Co.'s No. 2 Ryals, Refugio Couunty, is rigging up.

Houston Gulf Gas Co.'s No. 1 Tom O'Connor, Refugio County, is in gumbo at 810 feet and has 10-inch casing set at 260 feet.

William F. Morgan and others' No. 1 Welder, San Patricio County, about 2 miles east of Sinton is moving on.

Saxet Oil Co.'s No. 8 Dunn, San Patricio County, is location.

Saxet Oil Co.'s No. 3 White Point Development Co. is another location in San Patricio County.

Pargee Petroleum Co.'s No. 1 Beall, San Patricio County, is drilling at 810 feet with 10-inch casing set at 227 feet.

Serna-Forrest's No. 1 Benavides, Carolina-Texas Field, Survey 2,272, Webb County, is drilling having spudded in December 15.

W. O. Wheatley's No. 2 Reiser, is the first of several shallow tests in the Reiser Pool in Webb County, and is drilling, located in north one-half of Survey 1,617.

Morgan-Humphreys' No. 1 Harper, Cole Field, Duval County, is making location in Survey 323.

Cole Gas Field—Duval

Houston Oil Co.'s (Texas) No. 2 S. Benavides, corner Blocks 337-338-343 344, is on sand at 1,543-50 feet. Houston Oil Co.'s (Humble) No. 1 Juan V. Cuellar, Share 1, Cuellar grant, 3,300 feet to southwest lines and 2,324 feet to southeast lines, is moving on Cole Petroleum Co.'s No. 38 Benavides, Survey 10, Block 12, is location 155 feet to northeast and northwest lines; No. 50-B Benavides, Survey 5, Block 7, located 611 feet to northwest lines and 625 feet to northeast lines, is drilling at 1,500 feet.

Humble-Reiter-Foster Pool

Humble Oil & Refining Co.'s No. 7 Kohler, Survey 165, located 200 feet to north and west lines, is moving on. National Oil Co.'s No. 1 Ball, Survey 16, located 450 feet to north line and 150 feet to east line, is standing at 40 feet.

Piedras Pintas Dome

Humble Oil & Retining Co.'s No. 7 Walsh, Survey 185, located 2,050 feet to east line and 1,750 feet to north line, is drilling in blue shale at 4,189 feet.

Randaco Field—Jim Hogg

Magnolia Petroleum Co.'s No. 32 Merchants State Bank, Survey 415, located 850 feet to west line and 2,100 feet to north line, is drilling at 2,260 feet; No. 33 Merchants State Bank, Survey 415, is location. Johnson and others' No. 22 Palacious, Survey 291, Block 4, located 1,050 feet to west line and 450 feet to south line, is moving on.

Alworth Pool

Alworth-Stevens Hild's No. 10 M. Garza, Survey 39, Block 7, located 300 feet to northeast lines and 110 feet to southeast lines, is skidding derrick over.

Aviator Pool or Bruni Tracts—Webb

F. J. Bates' No. 1 Bruni, Block 47, located 150 feet to south and east lines, is drilling at 1,936 feet.

Cole Gas Field No. 2

Cole Petroleum Co.'s No. 36 Benavides, Survey 412, Block 14, located 159 feet to east line and 266 feet to north line, is still fishing at 5,525 feet having recovered part of the drill stem joints.

Mirando Pool—Zapata

O. W. Killam's No. 1 Benavides, Survey 12, Block 13, located 150 feet to southeast lines and 500 feet to northeast lines, is drilling at 1,560 feet.

Luling Field—Caldwell

Magnolia Petroleum Co.'s No. 3 McKinney is drilling at 1,725 feet. North & South's No. 1 Kelly is drilling at 7,268 feet; No. 2 Tiller is drilling at 6,815 feet. Pat M. Armstrong's No. 1 Hardeman, Miles G. Dykes Survey, 150 feet to northwest and southwest lines of farm, is putting in second boiler.

Dale Field

The Texas Company's No. 1 Moore, Jasper Gilbert Survey, is a location 150 feet to northeast and southeast lines; No. 1 Osteen, W. C. Swearingen Survey, 150 feet to northeast and southeast lines, has set casing; No. 2 Osteen, same survey, is location.

Adams Gas Field—Medina

Southern-Witherspoon Oil Co.'s No. 3 Redus, Survey 92, located 400 feet to north and west lines, has set surface casing at 61 feet; No. 5 Adams, 1,400 feet north of No. 4, is location. Witherspoon Oil Co.'s No. 1 Tidal lease is location in the western part of the field;

(Continued on Page 113)

GAS WELL ON DRISCOLL RANCH IN DUVAL COUNTY OPENS NEW FIELD

By B. D. Stevenson

SAN ANTONIO, Tex, Dec. 19.—What looks like a good gas well on the Driscoll ranch in Duval County means the opening of a new gas field about midway between the Cole Field on the southwest and the Piedras Pintas Field on the northeast, and about 12 miles from each. Driscoll drilled a lot of wells on his ranch for water and got shallow gas at around 600 feet in some. He drilled his seventh to below 2,400 feet and it blew out with a good volume of gas and spraying oil, but the hole was lost. His No. 7 is now in and has a rock pressure of 900 pounds at a depth of 2,434 feet. It is estimated at around 30,000,000 feet of gas.

Driscoll is a wealthy ranch owner with over 60,000 acres and his well is not very close to the edge of the ranch. It is understood he has turned down the offer of one big company to go in and drill the field and develop it, and proposes to drill it himself.

Another effort is to be made to bring in a field in the northwestern part of Duval County where Magnolia got a small gas well at around 4,000 feet and where Schlessinger Oil Corp. has drilled three holes with considerable oil at around 2,500 feet, but failed to make a well. Milo Trussell as trustee has started a hole on Survey 60 of the Moody ranch, 175 feet from the west and 150 feet from the north line of the NW NE of Survey 60. The well is about half way between the first two wells drilled by the Schlessinger Oil Corp. Trussell was interested in the first wells drilled. At last reports he was down 600 feet on the present test.

Some additional new wildcatting is to be done in the old Reiser gas field in Webb County for shallow oil. W. O. Wheatley did some drilling in that territory some months ago. Now he has arranged to drill several more wells to try and pick up a pool.

J. G. Pundt will test his Zavala County well the middle of this week. It is on the West ranch in the northern part of the county and at 1,312 feet has a chance of opening up a gas field. It was mentioned in last week's report.

Roxana is to drill a test on a supposed salt dome in Willacy County west of Raymondville. Willacy is next to the last county in the southern extremity of the state. There is a salt lake 10 miles west of Raymondville. The salt is so thick around the edges of the lake that Mexicans recover it by the wagon load and haul it away. Roxana used the seismograph and believes it is a salt dome. One other big company also shot it with the seismograph and is understood to be of the contrary opinion. This test by the Roxana is the first that has ever been drilled in that territory. Material for the rig is being assembled now and J. E. Barron is understood to be arranging for still another test in the same general area.

Duval County

Driscoll and others' No. 8 Driscoll, Survey 23, located 1,410 feet to south line and 563 feet to west line, is drilling at 1,500 feet.

Jim Hogg County

Paesano Oil Syndicate's No. 1 Campbell, Las Vivoritas grant, is drilling at 2,760 feet. O. W. Killam's No. 1 Ca-

(Continued on Page 113)

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Sweet Lake Discovery Well Revived

Flowing 500 Bbls. Through Quarter-Inch Choke. Pierce Junction Has 1,800-Bbl. Producer. Blue Ridge 880 Bbls.

By Neil Williams
Staff Correspondent, Gulf Coast Fields

HOUSTON, Tex., Dec. 19.—Production on the Sweet Lake Dome in Cameron Parish, Louisiana, was revived the past week when Pure Oil Co. completed working over its No. 3 Sweet Lake. The well came in flowing approximately 500 bbls. of 29.9 gravity oil daily through a quarter-inch choke. The well is producing from the same sand at 5,897 feet, at which it originally was completed in October of 1926.

This well was the discovery well of the Sweet Lake Dome of southern Louisiana originally coming in making an estimated 10,000,000 feet of gas and spraying approximately 200 bbls. of oil daily. Oil production soon increased to 750 bbls. daily, but was choked in and since then had declined to practically nothing. The crude at that time tested 30.5 gravity.

In October of 1927 the Pure Oil Co. started working over the well and succeeded in getting it back as a 500-bbl. producer. This company had one other producer at Sweet Lake, but neither that one nor No. 3 had produced for several until the past week.

Production at Sweet Lake has been found to be deep as indicated by the completion of No. 3 Sweet Lake. The Pure Oil Co. is the only operator, having discovered the dome through its geophysical work. Pure Oil Co. at present has only one other well actively drilling there, No. 4 Sweet Lake, which is down approximately 5,200 feet. No. 2 and No. 5 both are shut down below 5,100 feet.

New Flush Production

With the exception of this well, an 1,800-bbl. work-over completion at Pierce Junction Dome in Harris County, Texas, and an 880-bbl. flowing well at Blue Ridge, Fort Bend County, completions in the Texas and Louisiana coastal territory offered little of interest. No other wells were brought in with an initial production of more than 200 bbls. daily and the majority were under the 100-bbl. mark. However, new flush production added to this district during the week totaled more than 4,500 bbls.

For the first time in many weeks, the Spindletop Field near Beaumont in Jefferson County failed to produce a single new well. Considerable activity is under way in that field, particularly toward the southwest, where the play for the new deep production is centered, and several wells are in sands at producing levels, but tests the past week were unfavorable and holes are being deepened.

For the most part, completions during the week were old wells worked over or deepened. Among the new wells from the "grass roots" were two typical small pumpers of heavy gravity crude on the Brenham Dome on the Austin-Washington County line; two shallow pumpers at Boling, Wharton County; a small pumper in the Evangeline district of Acadia Parish, Louisiana, and an 880-bbl. flowing well at Blue Ridge, Fort Bend County. The 11 other producer completions were work-overs.

"Work-overs" and old wells deepening make up a large part of Gulf Coast operations at this time and it is only natural that very little of new importance is being opened. Wildcatting is on but a limited scale and most of this is being done by the larger companies, where new salt domes are believed to have been located by geophysical work. Because companies locating prospective domes usually block up extensive acreage in those vicinities themselves there is very little of interest from a leasing standpoint in this territory.

Geophysical work is being carried on all the time by all the major companies over the coastal territory of Texas, Louisiana and extending into Mississippi but this is being conducted quietly. There has been a slight lull in the work for several weeks, but after the close of the holiday season it is expected geophysical operations will be conducted on a larger scale than ever before.

New Duval Gas Field

Houston oil operators the past week were especially interested in reports from southwest Texas, where Bob Driscoll, in Duval County, apparently has opened a new prolific gas field. His No. 9 test was brought in blowing an estimated 40,000,000 feet of gas daily with a rock pressure of 900 pounds from sand at 2,439 feet. With the exception of some small, shallow gas production in that vicinity, the new well is from 3 to 4 miles from the nearest production.

Driscoll first drilled seven shallow tests ranging from 500 to 600 feet in depth except for No. 7 drilled to 1,800 feet, and encountered some small production. His eighth well was drilled to the 2,400-foot level and found the gas, but the hole could not be completed, and No. 9 was drilled. This well is carried as No. 8 by most companies, considering No. 9 as the second hole for No. 8. The No. 7 encountered gas which had pressure but no volume. These wells are on a 60,000-acre block in the southwestern part of the county near Sweden.

Production Increase

Production in the Texas and Louisiana coastal territory increased only 1,508 bbls. in the daily average the week ending December 17, compared with the previous week. Spindletop, which has been experiencing sharp increases for several weeks, was virtually steady the past seven-day period, with no wells completed. This largely was responsible for the fact that a greater increase in the daily average for the entire district was not shown.

Decreases were reflected in the daily average production of East Central and Southwest Texas fields, but these were not large. Daily average production by fields in the three general districts follows:

Gulf Coast

Spindletop	56,558
Saratoga	1,084
Batson	1,270
Goose Creek	7,414
Sour Lake	3,837
Hull	12,503
Big Creek	2,463
Columbia	8,801
Humble	3,735
Pierce Junction	13,782
Blue Ridge	5,520
Markham	250
Orange	3,980
Damon Mound	835
South Dayton	273
South Liberty	2,011
High Island	252
Moore's Field	22
Boling	2,039
Nash Dome	1,355
Barbers Hills	700
Vinton	4,816
Starks	310
Edgerly	2,613
Evangeline	1,195
Lockport	5,785
Sulphur	400
Sweet Lake	450
Hackberry	655
Total this week	144,908
Total last week	143,400
Increase	1,508

East Central

Mexia	8,698
Cedar Creek	1,100
Nigger Creek	1,360
Currie	548
Wortham	2,355
Richland	671
Powell	13,210
Total this week	27,942
Total last week	28,317
Decrease	375

Southwest

Somerset	2,335
Lytton Springs	1,606
Dale	399
Luling	14,896
Miscellaneous	6,610
Total this week	25,846
Total last week	25,865
Decrease	19

Brenham Dome

On the Brenham Dome on the Austin-Washington County line, two small, shallow pumpers were completed during the week. Carlisle and associates' No. 1 Pomacal is making 10 bbls. daily from a sand at 225 feet and La Marque Oil Co.'s No. 1 Conklin is making 5 bbls. daily from 190 feet. The former is in Austin County and the latter in Washington County. These wells are typical Brenham producers, all of which have been small pumpers of heavy gravity crude. Two new tests, both in Washington County, are starting at Brenham, these being Miller and associates' No. 1 Pennington and Pratt and associates' No. 2 Brinkmeyer.

Austin County

Humble Oil & Refining Co. is active at Raccoon Bend, Austin County. This company during the week abandoned its No. 1 Wilson in that field but already has rigged up for another test, No. 1 Stravoski. Its No. 2 Gotosky Saturday was drilling at 1,805 feet. No. 1 Wilson test was drilled to 1,243 feet where it was in a sand but encountered no showing of oil.

Anderson & Lyle's No. 1 Goebel in Austin County at last reports still was shut down at 1,310 feet, but operations are expected to be resumed at any time.

Brazoria County

Roxana Petroleum Corp. still is working on its No. 1 Allen Bernard on the Allen Dome. This well made five heads amounting to about 25 bbls. in the 24 hours ending Saturday morning. Bailing was continued all Saturday with 40 feet of salt water bailed from the bottom. The hole has 400 feet of fluid standing. This company's No. 4 at Allen Dome is in a hard sandy lime at 4,236 feet although at this writing it is shut down temporarily for minor repairs. At this depth the test evidently has gone into a third hole. The test originally was drilled to a total depth of 5,384 feet. It then sidetracked the old hole at 4,484 feet and drilled a new hole down to 4,769 feet but after coming out of the hole and going back in the bit was only able to go to a depth of 4,236 feet. Roxana's No. 1 Random at Allen is drilling in sticky shale streaked with sandy lime at 4,304 feet.

On the Clemens Dome, also in Brazoria County, Roxana is milling out a back pressure valve in No. 2 Bell. This hole is down 4,872 feet.

Humble Oil & Refining Co.'s No. 4 Coon, West Columbia, Brazoria County, is fishing liner. This is an old well to be worked over and deepened, but on which operators have had considerable fishing troubles.

At Stratton Ridge, in the southern part of the county, Gulf Production Co. is active on its No. 3 Perry, which is drilling at 3,793 feet.

Chambers County

Humphreys Corp. has made a 125-bbl. pumper out of its No. 2-A Kirby at Barbers Hill after working it over. No. 6-A Kirby has been abandoned at 2,400 feet. Humble Oil & Refining Co.'s No. 5 at Barbers Hill was drilling Saturday in a shale formation at 3,200 feet.

A report got out during the week that Pure Oil Co.'s No. 1 Lost River at Lost Lake had hit the salt dome but this was erroneous. Saturday the test was drilling in a sand at 2,341 feet. This is to be a deep dome test.

At High Island, near the shore of the Gulf of Mexico in Chambers County, Gulf Production Co.'s No. 2 Smith is drilling below 3,540 feet. McLean Oil Co., an active operator in this field, is drilling near 4,000 feet in its No. 10 Cade, around 3,300 feet in its No. 11 Cade and has resumed drilling in its No. 6-C Cade after sidetracking the old hole at 2,150 feet.

Colorado County

Merritt Drilling & Development Co.'s No. 1 Svrceck, 1½ miles southeast of Ellinger, still is shut down and so far as records are concerned, has been abandoned. This test was drilled only to 469 feet, where it has been idle for several months. Rich Oil Corp., however, has spudded in at its No. 1 Von Rosenberg fee, in Colorado County and is expected to rush drilling to completion. There is one other test in the county, B. A. Johnson's No. 1 Breeding, which is getting ready to start drilling.

Fort Bend County

At Blue Ridge, Fort Bend County, Gordon, Folwell & Dickson's No. 1-A Sharp is flowing approximately 880 bbls. of pipe line oil from a sand at the 2,800-foot level. Blue also got a 75-bbl. pumper in Cunningham Production Co.'s No. 1 Blakely, which was completed around 2,860 feet. The former operators' No. 3 Blakely is drilling below 950 feet. Cunningham Production Co.'s No. 3 Blakely tested salt water at 3,210 feet, but it is reported this hole is to be deepened. Cunningham's No. 1 Blakely, an old well, is getting ready to deepen.

H. R. Cullen and associates Saturday were testing their No. 1 Blakely at Blue Ridge. This test has a sand topped at 3,568 feet where 6⅝-inch casing is set. Gulf Production Co.'s No. 13 West Schenck is drilling at 3,485 feet. Navarro Oil Co. has a rig up for No. 4-A Robinson heirs and will start drilling immediately. No. 1-B Robinson, an old well drilled by the Navarro Oil Co., is starting to work over. Sam Watts and associates have a derrick up for a test in this field. This will be the second test drilled by these operators on the Blakely land.

Gulf Production Co. is drilling at 3,652 feet in its Moores Field test, No. 14 Moore and associates This is the only test in this district. This field is small having a daily average production the past week of only 22 bbls.

At Big Creek, Fort Bend County, Gulf Production Co.'s No. 44 Davis is drilling at 3,940 feet. Its No. 34 Davis, an old well being worked over, still is reaming.

Gulf Production Co.'s No. 6 Woolf at Long Point, Fort Bend County, topped the salt at 975 feet and has been abandoned. This company has another drilling test in this district, the No. 2-A Beard.

Humble Oil & Refining Co.'s No. 1 Sugar Land Industries, near DeWalt, Fort Bend County, is being rigged up to start drilling the coming week.

At Nash Dome, also in Fort Bend County, Rycade Oil Corp. is down 3,974 feet in its No. 18 Wisdom. No. 19 Wisdom is drilling at 2,904 feet in crystallized sand and lime which apparently is anhydrite No. 20 Wisdom is in gumbo at 2,940 feet. Rycade was preparing to drill plug Saturday in its 12½-inch string at 1,193 feet. This string is merely the

(Continued on Page 117)

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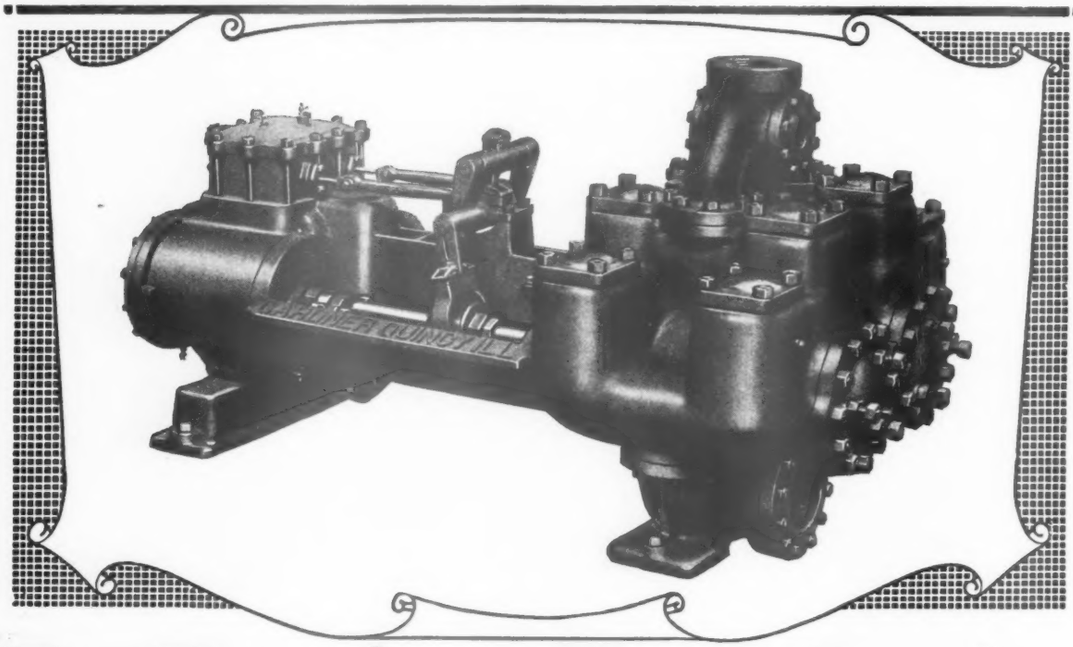

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Salt Creek Royalty Oil Transfers

Producers & Refiners Contract Assigned to White Eagle Co. Negotiations for Other Holdings Are Reported

By Tolbert R. Ingram
Staff Correspondent, Rocky Mountain Area

DENVER, Colo., Dec. 17.—News of drilling operations in the Rocky Mountain area for the week was mostly secondary in interest to other developments. Wyoming reported the transfer by the Producers & Refiners Corp. to the White Eagle Oil & Refining Co. of its contract for the purchase of royalty oil from state lands in Salt Creek, and negotiations are reported pending for the sale of the New York Oil Co.'s royalty and working interests in Salt Creek to companies affiliated with the Midwest Refining Co. Continental Oil Co. is reported negotiating for holdings of the Salt Creek Syndicate. There were no completions in Salt Creek for the week, and only one well was completed in other areas, this being a 10-bbl. producer in Weston County.

In New Mexico, the Texas Production Co.'s No. 2 Robinson, in Eddy County, is at a critical stage at 3,890 feet and so far has shown only rainbows and a little gas. Getty Oil, Inc.'s No. 1 Hinkle, 10 miles southeast of Artesia, swabbed 75 bbls. in a three days' test, and oil was swabbed down. Several Lea County wells near the abandonment stage are to be shot in final efforts to make producers out of them. A showing of 40 gravity oil in Catron County in a well drilled for water is attracting some attention, and speculators may possibly prevent testing of the Stony Butte structure in San Juan County by high prices asked for acreage. Producers & Refiners is abandoning its second test on the Hospah Dome.

In Colorado, the Texas Production Co. has found the Sundance sand saturated in its No. 10 Knowlton, on the Moffat Dome, but there is some water with the showing and the outcome still remains a little uncertain, though commercial production already has been proven below the Dakota in the Morrison sand. The Midwest has killed its No. 4-SD Shaw, a 1,000-bbl. well on the Iles Dome, in an effort to recover the 8¼-inch bit and drill deeper. Moody Oil Corp. will continue its Dolores County test which was dry at 3,800 feet. The Wellington Pool in Larimer County is showing some freak results with water wells turning to oil.

Utah has one operation attracting attention in the Midwest Exploration Co.'s test on Ashley Creek which is making gas in the Morrison.

Wyoming

Reports of pending deals for royalty and working interests, assignment of contracts, and the landing of an export order for the Casper refineries took precedence this week in the news from Wyoming. One of these was the assignment by the Producers & Refiners Corp., of its contract with the State of Wyoming for the purchase of its royalty oil in the Salt Creek Field to the White Eagle Oil & Refining Co. The deal was effective as of December 1, but was not announced until after the State Land Board had given its approval. Several years ago the Producers & Refiners had plans under way for building a refinery at Casper to operate on Salt Creek crude. The plans were subsequently changed and the refinery was built at Parco, but the company developed considerable flush production and had a supply of crude in excess of its own requirements. It made a contract with the White Eagle Oil & Refining Co. to supply it a definitely stated quantity of crude for its Casper refinery. In 1923, the Producers & Refiners obtained the contract for the purchase of the state's royalty oil from Sections 16 and 36. This contract expires September 30, 1929. Recently the company has had to pay a premium for crude to meet the requirements of the White Eagle contract and out of the situation that developed, the Producers & Refiners agreed to the transfer of the royalty oil contract to take the place of the other agreement. Section 36 in Salt Creek is operated by the Midwest Refining Co. for affiliated interests, the Salt Creek Producers and Mountain Producers, the royalty paid the state being 65 per cent. The royalty oil shipments at present average around 1,000 bbls a day.

Salt Creek Royalties

Several deals for Salt Creek royalty interests are reported pending. One of these is to the effect that negotiations are under way between the New York Oil Co. and the Salt Creek Producers Association and Mountain Producers Corp., for the sale to the last two named the New York's royalty and working interests in the Salt Creek Field. While the deal has not been closed, as far as can be learned, nor official confirmation on negotiations obtained, it is believed that such a deal is near consummation. Negotiations have taken place at intervals for the past few years, but no deal resulted on account of the inability of the parties to reach a basis of agreement. New York Oil has varying interests in 4,560 acres upon which are 633 producing wells. It is understood that if a deal is consummated, that the New York Oil Co. will retain its various gas and public utility properties and continue to operate as a public utility.

Another deal reported pending is for the purchase by the Continental Oil Co. of the properties of the Salt Creek Syndicate including a 50 per cent interest in two 80-acre tracts now being operated by the Continental, and a 50 per cent interest in 120 acres operated by the Western State Oil & Land Co. A meeting of the syndicate to act on proposals was called for December 5, but was adjourned until January 9 without reaching a decision.

Midwest Refining Co. has received an order for 35 tank cars, or 300,000 gallons of motor oils from Robert F. Cruickshank, a New York exporter, for shipment to Europe. Movement of the order through New Orleans has commenced.

Drilling Operations

Drilling operations in Wyoming did not result in any completions for the week with the exception of a small well by the Royal Osage Oil Co. in its No. 1, SW Section 31-46-43, in the Osage Field in Weston County. It is estimated good for 10 bbls. from a total depth of 343 feet.

The Standard Oil Co. of California's test in the SW SE, Section 11-29-115, in the Snyder Basin, in Sublet County, is reported shut down for the winter at 1,500 feet. At last report it was getting ready to cement bottom to shut out water. It had a small showing of oil in the top of Thayne lime at 1,117 feet. The Rainbow Oil Co., also operating in Sublet County, has announced its intentions of not drilling any more wells until spring. It recently completed its No. 7-A with an initial production of 50 bbls., and this wound up its program for the year.

In the La Barge area, the Reece Oil Co.'s No. 2, NW Section 27-27-113, is trying for a formation shutoff with the 8¼-inch casing at 1,114 feet. Joe Minton's No. 1, Lot 1, Section 4-26-113, is drilling at 175 feet. Minton's No. 1 on Section 34-27-113, is drilling at 675 feet. M. J. Goldberg's No. 1, Section 16-26-113, is drilling at 440 feet. Texas Production Co.'s No. 1 Davis, Section 15-26-27, is making 44 bbls. of oil and 200 bbls. of water from total depth of 830 feet. Associated Producers' No. 1, Section 35-27-113, is underreaming the 8¼-inch at 1,640 feet, with total depth of 1,660 feet. W. D. Newlon's No. 1, Section 12-26-113, is bottomed at 1,507 feet and underreaming the 8¼-inch casing. A. H. Squires' No. 1, NE SW, Section 36-27-113, is drilling at 1,600 feet. Midvale Oil Co.'s No. 1 Fallis, Section 8-27-113, had to shut down on account of water line freezing. California Petroleum Corp.'s No. 2-I, Section 3-26-113, is running 6¼-inch liner; No. 4-A, Section 34-27-113, is drilling out cement; No. 7-J, Section 3-26-113, is waiting for a 6¼-inch casing spear; and No. 4-I, Section 34-27-113, is rigging up.

In Uinta County, within the town limits of Evanston, the Uinta Oil & Development Co.'s test is cementing off a heavy flow of water at 1,200 feet. Drilling will be resumed as soon as the cement sets. There is considerable gas pressure back of the water.

Torchlight Field

In the Torchlight Field in Big Horn County, near the town of Basin, the Producers & Refiners Corp. is laying a 2-inch line from its lease to Basin, a distance of 3 miles. The company has been working over some old wells on its lease and increased the production. The output will be sold to J. H. Walden who recently acquired the old Alliance Oil & Refining Co. plant at Thermopolis, to which place the Torchlight crude will be shipped. The refinery has been overhauled and put in condition for operating. It will run black crude from the Warm Springs Field, 6 miles east of Thermopolis, and from the Torchlight Pool.

In the Oregon Basin area in Park County, the Producers & Refiners' No. 1 Frisby, Section 32-52-100, is drilling in sand at 305 feet. Continental Oil Co.'s No. 1-A State, Section 15-51-101, is drilling at 1,605 feet. Wolverine Oil Co.'s No. 1 Rue, SW Section 28-51-100, is making faster time with rotary, and is drilling at 1,610 feet. Ohio Oil Co.'s No. 1 Batson, Section 6-50-100, is drilling at 1,458 feet. Wisconsin Holding Co.'s No. 1 Roush, Section 9-51-100, is jarring on casing at 2,087 feet. Linco Oil Co.'s No. 1 Rousseau, NW Section 33-51-100, is drilling at 1,775 feet. Ferdig-Wyoming Oil Co.'s No. 2 Hough, Section 19-51-100, is bailing water at 2,150 feet. Cody Petroleum Co.'s No. 2, Section 7-51-100, is drilling at 2,515 feet.

In Sweetwater County, the Prairie Oil & Gas Co.'s No. 7-B, Section 14-26-90, Lost Soldier area, is being abandoned at 1,323 feet. Same company's No. 43-A, Section 10-26-90, is being drilled deeper from 1,526 feet. Utah Oil Refining Co.'s No. 7-A Hughes, Section 2-26-90, is waiting for cement to set at 2,506 feet, at which depth the 5⅞-inch was landed.

New Mexico

The Texas Production Co.'s No. 2 Robinson, NW cor. SW, Section 25-16-

(Continued on Page 119)

ROYALITE PRODUCTION AGGREGATES 786 BBLS. ON DAILY AVERAGE

By Victor Lauriston
Staff Correspondent, Canadian Fields

CHATHAM, Ontario, Dec. 17.—Official figures of the November production of crude naphtha from the Turner Valley Field show an aggregate for the month of 23,586 bbls., or an average of 786.2 bbls. a day. This production came from eight producing wells, Royalite Nos. 1, 2, 3, 4 and 7; McLeod No. 2, Vulcan No. 1 and Illinois-Alberta No. 1.

There was in addition to this crude naphtha production a somewhat smaller production of light crude from wells in the Dakota sand, the most important of these being the New McDougall-Segur Nos. 1 and 2; but complete figures covering this light crude production are not available.

The chief crude naphtha production come from Royalite Oil Co.'s No. 4, LSD 12, Section 7-20-2w5, which in November showed the largest production since last May, and is once more experiencing its seasonal incerase as the result of colder weather. The aggregate output of Royalite No. 4 for November was 18,043 bbls., an average of 601.4 bbls. a day. The November daily average was 41.9 bbls. higher than in October and 51.9 bbls. higher than in September. Royalite No. 4 has been producing continuously since it was brought in on October 14, 1924, and shows no indications of actual diminution, the fluctuations being merely seasonal.

Royalite No. 7, LSD 3, Section 13-20-3w5, was put on the pipe line in the course of the month. Its production falls considerably short of early unofficial estimates. In a seven-day period it showed 155.2 bbls., an average daily production of 22.7 bbls. Unofficial estimates when the well was brought in placed the potential recovery from the wet gas flow as high as 100 bbls. a day. The total Royalite deliveries in November amounted to 18,440.7 bbls., a daily average of 615 bbls. The three older Royalite wells which were not drilled to the Madison limestone, showed a gasoline recovery through the absorption plant of 242.5 bbls. for the month.

Crude naphtha deliveries from other Madison limestone producers in November aggregated 5,146 bbls. The detailed figures as given by the Royalite Oil Co., to whose lines the production is delivered, showed for the McLeod Oil Co.'s No. 2, LSD 16, Section 1-20-3w5, an aggregate of 1,192.2 bbls., or 39.8 bbls. a day; Vulcan's No. 1, LSD 11, Section 13-20-3w5, a total of 1,288.5 bbls., or 42.9 bbls. a day, and Illinois-Alberta No. 1, LSD 14, Section 12-20-3w5, a total of 2,665.3 bbls., or 88.9 bbls. a day. Vulcan No. 1 was out of production for a large part of the month, and is now reported making better than 100 bbls. a day.

This production is all 73 degrees crude naphtha. The Royalite Oil Co. pays the independent companies $3.95 a barrel net for all deliveries, on which basis the November deliveries to the Royalite pipe line from all wells would be worth $93,164.70.

Recent estimates of light crude production per day from the various Dakota

(Continued on Page 117)

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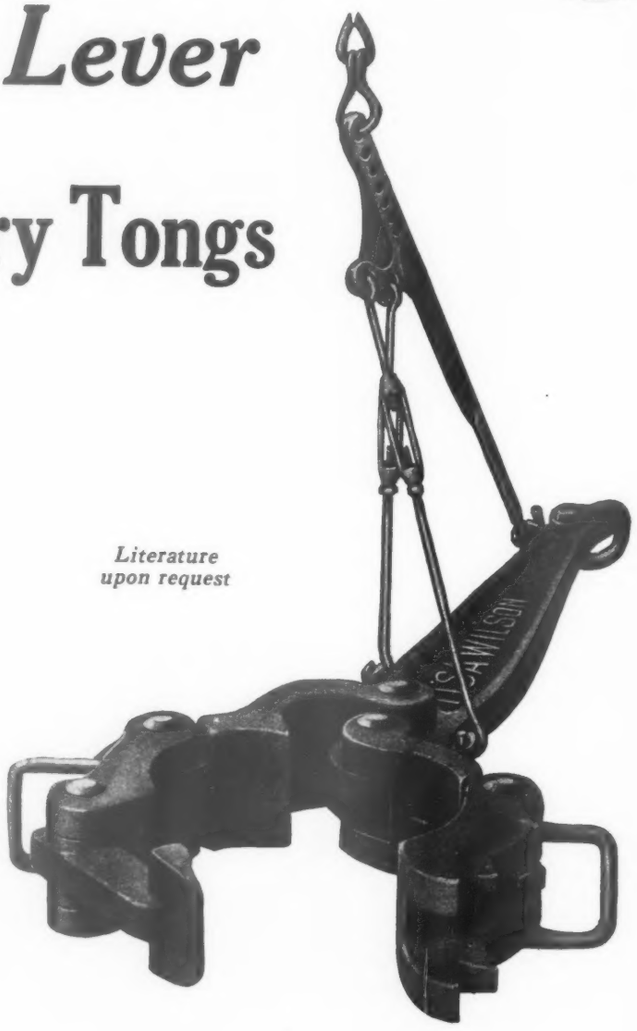

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New Field Discovered in California

Latest Addition to State's Proven Territory Is in Mon Bluff-Knob Hill Area, 2 Miles Southwest of Mount Poso

By L. P. Stockman
Staff Correspondent, California Fields

LOS ANGELES, Calif., Dec. 19.—The outstanding development of California during the week was the discovery of another new field and it is within the realms of possibility that still another may be opened up within the very near future. The latest proven district added to California's rapidly growing list is located in the Mon Bluff-Knob Hill area about 2 miles southeast of the Mount Poso Field in Kern County. The General Petroleum will receive credit for the discovery of this new field due to the fact that it was the first to secure production, but the Union Oil Co. will share the honors as this concern was the first to work out the structure. The latter's policy of holding up all unnecessary work as long as possible probably prevented it from chalking up another conquest.

The General Petroleum's discovery well was No. 1 Glide in Section 21-27-28, which was finished at 1,738 feet. The absence of pipe line facilities precluded a continuous production and consequently the well was shut in after a short preliminary test which indicated a potential of 500 bbls. per day. It is not likely that any aggressive drilling campaign will be undertaken as the oil is of a rather heavy grade testing 16.4 degrees. It is quite probable, however, that another new well will be finished in this field soon as the Union's wildcat in Section 28-27-28, is standing cemented with an early resumption of work on schedule. The writer has called attention to this district on numerous occasions and a few weeks ago stated that geologically the area was extremely favorable for the accumulation of oil in commercial quantities. The discovery of oil therefore did not come as a surprise and it might also be mentioned in passing that similar additional accumulations may subsequently be found at other points along this same Mount Poso-Round Mountain fault zone.

Wildcatting on Increase

Wildcatting activities in central California are increasing in scope from week to week and this prospective work may exert an appreciable effect on state production during 1928 if a few more new fields are opened up between now and next summer. The San Joaquin Valley is a vast area presenting almost unlimited possibilities and with the future production of the state destined to come from that section it is but natural to anticipate increased drilling as time goes on. Attention has already been directed to the probable existence of a series of new fields along the Bear Mountain shear zone in Kern County. The Pacific Eastern Production Co. is still patiently plugging along in the Union Avenue section near Bakersfield and based on developments to date this concern's perseverance should eventually be rewarded with commercial production. The Pacific Eastern is also drilling a rather interesting test out at Fruitvale, a few miles further northwest, and work in this area should also be watched closely. The possibility of developing commercial production along the Bear Mountain shear zone was further enchanced a few days ago when a preliminary production test was made on the General Petroleum's wildcat in the Edison district, a few miles southeast of the Fruitvale and Union Avenue sectors, where the Pacific Eastern has developed encouraging indications. The General Petroleum's wildcat in question is No. 1 Edison in Section 5-30-29, specific reference having been made to this prospect during the past several weeks. The failure to secure an effective water shutoff prevented a satisfactory conclusive production test, although the well, upon being drilled out, ran a stream of oil and mud up over the crown block. Subsequently swabbings failed to stimulate a steady flow and it is quite probable that another cement job will be undertaken as it was impossible to lower the water level below 800 feet. The failure of the fluid to follow through upon being swabbed indicates a probable low gas pressure but the showings to date are exceptionally encouraging as they are indicative of something nearby.

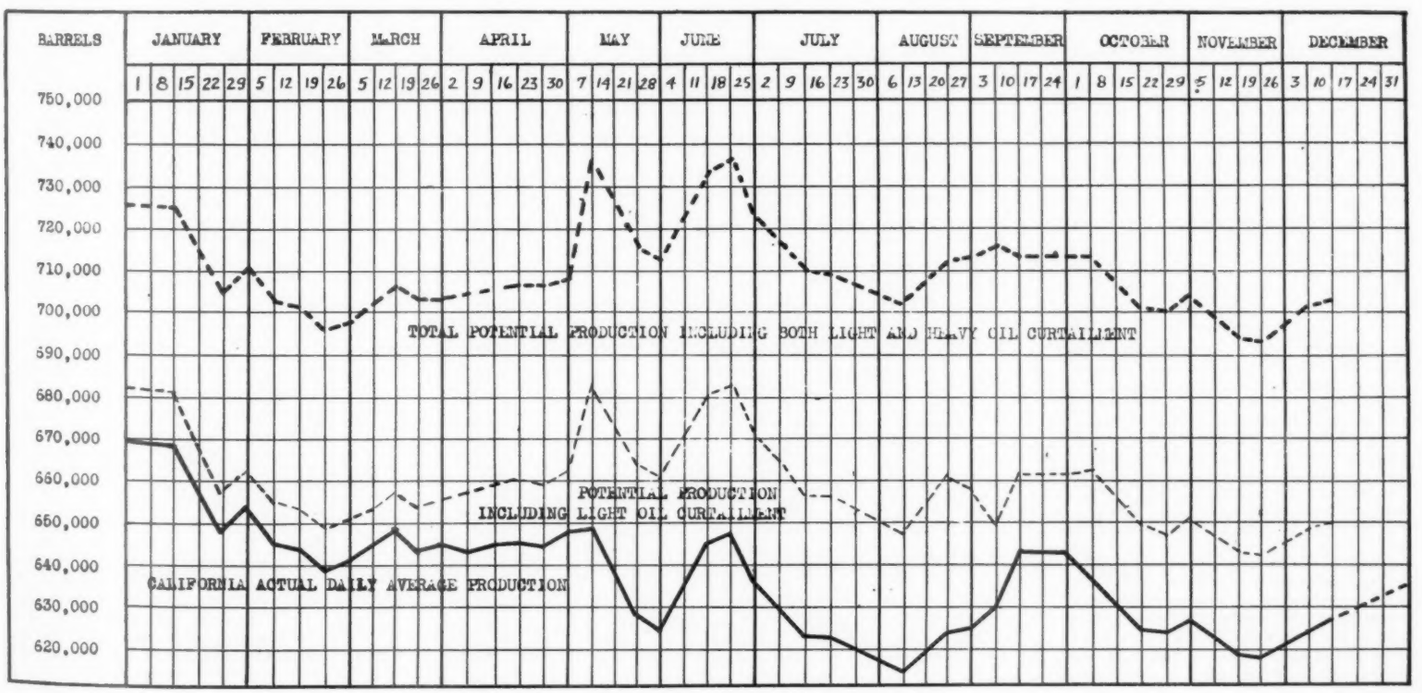
Outlook Summarized

Glenn D. Robertson of the Associated Oil Co. delivered a very interesting summary a few days ago on the general outlook for 1928 and, while the resume in question, which was presented before the American Institute of Mining Engineers, will not be released for general use, it might be of interest to mention a few of the high lights brought out. Long Beach, Ventura Avenue and Seacliff were designated as the most important factors during the early part of 1928, although reference was made to several other areas which are expected to show minor increases during the coming year. These included Kern River and Richfield, although deep sand development in the latter has slowed up and will probably not exert any appreciable effect next year. Additional development work in the former area, however, is expected to result in a small consistent gain. One of the most interesting features brought out was the fact that production in the Inglewood Field could probably be increased at least 50,000 bbls. per day within three or four months if the deep sand drilling was pushed to the limit. The maximum daily production of the Long Beach Field due to exploitation of the deep sand was placed at from 175,000 to 190,000 bbls., with the peak anticipated in March or April. Ventura Avenue is expected to show increased production in 1928 and there is also a possibility of increased production at Seal Beach, although drilling operations in the latter district may be held down to a minimum.

Long Beach

Operations in the Long Beach Field during the past week were marked by the starting of approximately 28 new wells and the staking of 12 additional locations. Completions were not exceptionally numerous but new development work was very conspicuous, in fact present indications confirm previous opinions that approximately 200 strings of tools will be in operation in this field before the new year rolls around. One of the most significant things in connection with this new work is the fact that the projected drilling is practically general throughout the field and is not limited to any particular group of companies or any restricted section. The California Eastern spudded in two new wells, No. 1 Campbell and No. 28-A Marine, and is rigging up rotary equipment for immediate work in No. 1 Paulson. In addition to these three new holes the company has started preparations to redrill and deepen No. 1 Capital up on Signal Hill, a relatively short distance from the Shell's initial discovery well, No. 1 Alamitos. The California Petroleum also started several new wells, No. 2 Ellis, No. 9 Harlow Kent and No. 2 Reedy Dubois, during the past seven-day period and additional drilling will get under way in the very near future. Recent completions have increased the potential value of this company's properties to a very appreciable extent and with several leases actually proven up for big production it is needless to say that additional development work is contemplated.

The Richfield Oil Co. is making a strong bid for big production in the deep sand and, while this company has already finished several really large flowing wells, there are several more nearing completion and this group will be followed by still more as time goes on during the early part of 1928. The Richfield spudded in three new wells during the past week and should start work on a like number within the next 10 days. The company's latest completion is No. 9 Booth, which was finished a few days ago at 6,037 feet. It started off flowing 1,905 bbls. of clean 29.9 gravity oil and seems to be increasing instead of declining, as might be anticipated. This well was followed into production by No. 9 Haas, which is flowing 675 bbls. of 30.1 gravity oil from 5,810 feet. No. 1 Hoffman, which was brought in last week flow-



ing 4,425 bbls. per day, is still holding up exceptionally well, run sheets during the past 24 hours revealing an actual production of 4,220 bbls. The Shell finished one well during the past week, No. 3 Patton Wilson, which was redrilled and deepened from the upper to the lower zone at 5,200 feet. It registered an initial of 650 bbls. of clean 28.1 gravity oil daily and, while it did not show the gusher production which has characterized recent completions, this is due to the fact that mechanical trouble did not permit the company from taking advantage of the maximum penetration available. The Shell, like a number of other operators, spudded in several new wells, No. 31 Alamitos, No. 4 Martin and No. 7 Hutton, during the current week and this trio will be supplemented by two more within the next five or six days.

J. E. O'Donnell, who experienced considerable success at Los Cerritos, has two wells headed down for the deep sand at the present time but, with rigs going up for Nos. 63, 64 and 65, this progressive operator should secure a satisfactory production early next year. The Rio Grande Oil Co. recently spudded in No. 2 Flower State and No. 3-A Municipal and should follow a similar procedure with No. 2-B Municipal as rotary equipment is now being rigged up. The Union Oil Co. spudded in Nos. 16 and 17 on the Long Beach Community lease and is rigging up rotary equipment in Nos. 18, 19 and 20. E. B. Campbell, who finished a 4,000-bbl. well a few weeks ago, has just spudded in Nos. 3 and 4. E. T. Edwards, another operator who recently finished a large flowing deep sand completion, has Nos. 2 and 3 on the Brayton lease under way and will spud in No. 1 Bradley within the next few days. George F. Getty, probably one of the most progressive independent operators in the state, has four wells headed down to the deep sand, No. 18 having been spudded in a few days ago.

The Herndon Petroleum Corp., which has been operating quite successfully for several months in the Richfield district, spudded in No. 4 at Long Beach during the early part of the current week and Nos. 5, 6, and 7 should be started down shortly as rigs are in course of construction at the present time. The A. T Jergins Syndicate, drilling on acreage owned by the city of Long Beach, spudded in No. 22 and will have No. 23 under way soon. The above list of new wells started during the past week is only a part of the total number of actual spuds made. Others might include the Bellview, Biltmore, R. R. Bush, T. J. Cannon, J. W. Cox, Rainbow Petroleum, Travis Drilling Co. and General Petroleum. The Graham & Loftus Oil Co. chalked up another deep sand completion during the week when No. 1 Butler came into production flowing 2,315 bbls. of clean 29.1 gravity oil and 1,500,000 feet of wet gas from the 5,996-foot level. The Continental Oil Co., which started the ball rolling out in the Richfield district by extending the outer limits of that field due to deep sand drilling late last year, is building a rig for its first undertaking on the Kupfer property in the Long Beach Field and this well, which is located in proven territory, should come into production along about next April, unless some unforeseen difficulty arises.

Ventura Avenue

Operators in the Ventura Avenue Field have just closed a rather busy week resulting from the completion of three new wells which registered an aggregate initial daily production of 3,725 bbls. of high gravity oil. This trio of new producers, incidentally, further complicated the conservation measures undertaken several months ago, the object of which was to conserve the natural gas resources as much as possible. Several producing wells have been standing pinched in for several weeks in order to reduce wastage of natural gas to a minimum but the excess production of natural gas was increased approximately 7,000,000 feet by the three new wells finished this week. The Bolsa Chica's No. 3 Hartman was the greatest offender as it is making approximately 5,000,000 feet daily. This well literally blew in through the drill stem yesterday morning making 5,000,000 feet of gas and 1,250 bbls. of clean 30.6 gravity oil daily from the 6,620-foot level. This well developed an extremely heavy gas pressure previous to completion and it required a copious use of hematite to prevent a premature blowout. It is quite possible of course that the initial gas production will decline, as usually occurs, in which event the production of crude should register a corresponding increase.

The Associated brought in a very satisfactory completion when No. 10 Hartman in the eastern part of the field was turned loose from 6,665 feet, the hole having been finished with a 6¼-inch oil string carrying 975 feet of perforated. It registered an initial of 1,850 bbls. of clean 30.1 gravity oil and approximately 1,000,000 feet of wet gas. No. 44 Lloyd has for some reason or other failed to respond to artificial stimulation but it will probably come in shortly as the heavy mud is probably temporarily holding back production. The Shell added another completion to its list of producers by bringing in No. 17 Edison doing 625 bbls. daily from 5,825 feet and while the initial production registered is below par the well may increase after it has been on production a little longer. The Petroleum Securities will probably finish two new producers on the Willett lease and a similar number on the Orton property early in the new year and this quartet is expected to add from 5,000 to 10,000 bbls. of new temporary flush production. The General Petroleum should also bring in another new producer within the next 90 days as No. 2 Hisey recently passed the 4,550-foot level.

Seacliff

The Pan American's No. 1 State, which was returned to production late last week flowing clean oil, again went to water and efforts are now being made to bring it back on commercial production. This is the discovery well which opened up the Seacliff Field, located approximately 15 miles west of the prolific Ventura Avenue district, and while it has made relatively clean production from time to time water subsequently broke in and made its producing period short lived. There are 15 wells actually under way in the Seacliff Field at the present time and another spud or two is anticipated in the near future. It is problematical just who will get the next commercial producer in this field, although the Pan American has a slight edge as far as depth is concerned. This concern has three wells on the Hobson fee property, one of which, No. 1, should be tanking oil in the near future. The Miley Oil Co. is setting a fast pace, however, and its No. 1 H. & H. looks good for early completion. The Chanslor-Canfield Midway Oil Co. has three new wells actually under way in addition to No. 1-A Hobson and No. 1-B Hobson, the two original tests, both of which developed mechanical trouble before a production test could be made. The General Petroleum only has one well drilling at the present time but another spud should be made within the next week. This company expected to have No. 1 Ferguson already well under way but litigation has delayed operations and actual spud may be held up indefinitely. There does not seem to be any end to the constant litigation which started almost simultaneously with the initial completion in this field and a concerted effort is being made to rescind all tideland permits in order to prevent drilling operations out in the open ocean.

Seal Beach

Drilling operations in the Seal Beach Field were devoid of any interesting developments during the week and decreased work in this area will result in fewer completions in the future. During the past several weeks abandonments in the Alamitos Heights town lot area have outnumbered completions and the California Petroleum further increased this margin a few days ago by listing No. 1 Hodges for abandonment at 4,931 feet. Development work in both the town lot section and older area of the Huntington Beach Field has become less active than heretofore although we may anticipate additional completions from time to time. In the former area the Standard has just recompleted No. 3 Huntington after reconditioning it and this well, which originally came in doing 831 bbls. daily from 4,068 feet in October, 1926, was returned to production pumping 115 bbls. Two wells were placed on production in the older section of the Huntington Beach Field, one of them being a recompletion. This was the California Petroleum's No. 1 Buck, in the extreme northern part of the field, which was returned to production pumping 151 bbls. daily after being plugged back from 4,435 feet to 4,345 feet. The Ohio Oil Co. secured it first production in California by bringing in No. 1 Slater a few days ago pumping 120 bbls. daily from 4,350 feet and while the output is cutting about 15 per cent this may clean up in time, although the cut may be due to an edgewater condition. The Standard is making preparations to start a few new wells in this field and another hole or two will probably be spudded in on the Bolsa Chica and Huntington leases shortly after the first of the year.

The Union recompleted No. 2 Chandler in the Rosecrans Field several days ago after cleaning out to bottom, and it was returned to production making 130 bbls. of 31.7 gravity oil daily. The Barnsdall, which finished two good wells in this field several weeks ago, is redrilling and deepening Nos. 1 and 9 on the O'Dea

(Continued on Page 117)

IMPORTANT SOUTHERN CALIFORNIA WILDCATS

Company, Well, Location—	S-T-R	Depth	Status
Associated, No. 1 Cypress, Potrero	34- 2-14	5,408	to recement
Smith & Carpenter, No. 1 Smith	35- 2-14	5,282	rebuild rig
Hurst Oil Corp., No. 1 Inglewood, Los Angeles Co.	28- 2-14	3,772	suspended
Mont. Park Oil Co., No. 1 Browning, Mont. Park	26- 1-12	3,164	hd. sd. drilling
Associated, No. 1 Patterson, Pico	13- 2-12	3,790	sd. hd. drilling
Circle Oil Co., No. 1 Pomeroy, Manchester	23- 3-14	4,280	suspended
Shell, No. 1 Mission, San Fernando	4- 2-15	4,980	hd. sd. drilling
Sou. Calif. Drlg. Co., No. 1 Mateson, El Segundo	1- 3-15	4,870	suspended
Carr, O. K., No. 2 Foster, San Juan Capistrano	13- 8- 8	4,230	suspended
Thomason & McCoy, No. 1 Rinz, Saugus	27- 5-16	1,610	suspended
Andrews, Otis, No. 1 Lancaster, Los Angeles Co.	23- 8-13	Rig	rigging up
Southwest Pet. Co., No. 1 Ramsauer, Watts	4- 3-13	4,302	suspended
Security Pet Co., No. 1 Lynwood, Los Angeles Co.	13- 3-13	Mtl.	building rig
San Clemente Oil Co., No. 1 Peck, Hawthorne	20- 3-14	5,536	recemented
Horowitz, R. R., No. 1 Hawthorne, Los Angeles Co.	19- 3-14	.....	location
O'Donnell, J. E., No. 1 Dupree, Hawthorne	29- 3-14	5,304	suspended
White Behr, No. 1 Watson, L. A. County	21- 4-14	3,795	little showing
Shell, No. 1 Allec. Placentia	31- 3- 9	5,313	hd. sd. drilling
Buttram, F. W., No. 1 Richfield, Orange Co.	36- 3- 9	Mtl.	building rig
Son. C. A., No. 1 Pinkerton, Orange Co.	5- 5-11	3,620	suspended
Olympic Refg. Co., No. 1 Sunset Beach, Orange Co.	19- 5-11	Mtl.	building rig
Stein, Leo, No. 1 Long, Orange Co.	21- 5-11	5,135	suspended
Shell, No. 1 Stern, Orange Co.	22- 3-10	2,599	hd. sd. drilling
Hemet Pet. Co., No. 1 Ward, Riverside Co.	9- 5- 1	1,715	hd. sd. drilling
Fuller & Gray, No. 1 Puente, L. A. County	14- 2-10	Rig	rigging up
Anchor Oil Co., No. 1 Hudson, Los Angeles Co.	19- 2-10	2,395	suspended
Mesa Pet., No. 1 Newport, Orange Co.	21- 6-10	619	sd. drilling
Pet. Securities, No. 1 Fairview, Orange	3- 6-10	4,116	hd. sd. drilling
Davenpor. O. & G., No. 1 San Marcos, San Diego Co.	25-12- 2	322	sd. drilling
Turner, S. S., No. 1 Escondido, San Diego Co.	25-12- 2	225	sd. drilling

IMPORTANT NORTHERN CALIFORNIA WILDCATS

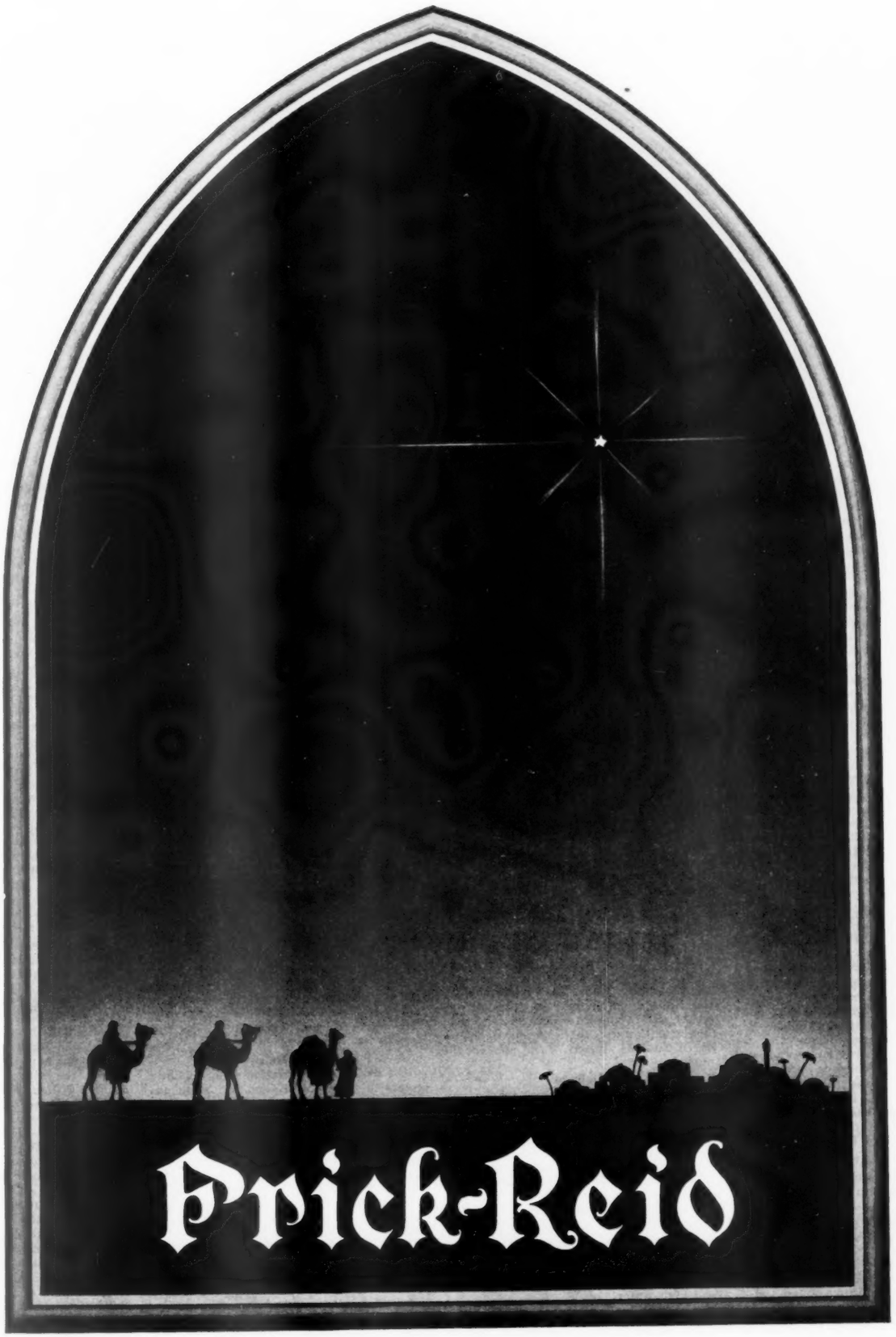
General Pet., No. 2 Ochsner, Kettleman Hills	26-22-18	5,381	br. sd. drilling
South Coalinga, Well No. 1, Kettleman Hills	35-24-19	2,930	pipe trouble
Monocline Dev. Co., Well No. 1, Kettleman Hills	7-21-21	4,250	br. sh. drilling
McPhail, Hugh, Well No. 1, Kettleman Hills	13-24-18	2,095	plugging
Milham Expltn., No. 1 Kettleman, Kings Co.	2-22-17	6,070	hd. sd. drilling
Shell, No. 2 Berlywood, Moorpark	32- 3-20	6,084	reaming
Star Petroleum, No. 2 Canet, Ventura Co.	13- 2-23	3,974	hd. sd. drilling
Continental Oil Co., No. 1 Burnham, Ventura Co.	22- 5-18	3,491	hd. sd. drilling
Standard, No. 1 Camarillo, Ventura Co.	29- 2-20	5,718	hd. sd. drilling
Standard, No. 1 Saticoy, Ventura Co.	9- 3-22	1,140	hd. sd. drilling
Petroleum Sec., No. 1 Diablo, Ventura Co.	26- 5-18	3,671	hd. sd. drilling
Bolsa Chica Oil Co., No. 1 Hidden, Ventura Co.	5- 4-18	Idle	lease extended
Parkford, E. A., No. 1 Strathern, Ventura Co.	5- 2-18	4,002	to test
Shell, No. 1 Strathern, Ventura Co.	6- 2-18	1,280	hd. sd. drilling
Miley Oil Co., No. 1 Red Mountain, Ventura Co.	7- 3-23	980	suspended
Richfield, No. 27 Piru, Ventura Co.	35- 5-18	1,902	suspended
Superior Oil Co., No. 1 Fillmore, Ventura Co.	33- 4-20	Rig	rigging up
Milham Expltn., No. 2 Buttonwillow, Kern Co.	8-28-23	4,662	gas well
Milham Expltn., No. 2 Kern, Kern Co.	8-28-23	Rig	rigging up
Milham Expltn., No. 3 Buttonwillow, Kern Co.	7-29-24	4,150	suspended
Morris, F. L., No. 1 Semitropic, Kern Co.	16-27-23	.....	location
Pacific Eastern, No. 1 Fruitvale, Kern Co.	21-29-27	3,550	gr. sd. drilling
Pacific Eastern, No. 1 Bakersfield, Kern Co.	6-30-28	4,800	deepening
General Pet., No. 1 Edison, Kern Co.	5-30-29	4,008	looks good
Get y, George F., No. 1 Edison, Kern Co.	22-29-29	3,717	plugging back
Midway Northern, No. 1 Edison, Kern Co.	29-29-30	Rig	rigging up
General Pet., No. 1 Mon Bluff, Kern Co.	21-27-28	1,738	new field
Union, No. 1 Mon Bluff, Kern Co.	28-27-28	1,781	cemented
Shell, No. 1 Mon Bluff, Kern Co.	3-28-28	3,470	hd. sd. drilling
Superior, No. 1 McFarland, Kern Co.	11-26-27	3,460	abandoning
North American, No. 1 Wallace, Delano	5-25-26	3,703	fishing
Fresno Madera Oil Co., No. 1 Clovis, Fresno	18-12-21	3,830	hd. sd. drilling
Barneyberg Oil Co., No. 1 Brown, San Luis Obispo	25-32-14	2,260	hd. sd. drilling
Richfield, No. 1 Wreden, San Luis Obispo Co.	10-29-17	2,490	hd. sd. drilling
Miley Ex. Co., No. 1 Carissa, San Luis Obispo Co.	15-29-17	1,760	hd. sd. drilling
Union Oil Co., No. 1 Huasna, San Luis Obispo	34-32-15	Rig	rigging up
Shell, No. 1 Cowell, San Mateo Co.	8- 6- 5	5,150	hd. sd. drilling
Shell, No. 1 Rossi, Petaluma	8- 5- 6	M. l.	building rig
Thomas & Hammill, Well No. 1 Alameda Co.	16- 3- 3	1,470	suspended
Buttrum, F. W., No. 1 Odin, Santa Barbara Co.	20-25-27	1,620	sd. sh. drilling
Elliott & Clarke, No. 1 Marcos, Santa Barbara Co.	3- 6-29	3,618	br. sh. drilling
Gorham, G. O., No. 1 Orcutt, San a Barbara Co.	33-10-34	Mtl.	building rig
Becker, Geo. F., No. 1 Summerland, Santa Barbara	33- 4-25	3,060	water trouble
Pet. Exp. Co., No. 1 Modoc, Santa Barbara Co.	20- 4-27	955	sd. drilling
Birch Oil Co., No. 1 Porterville, Tulare Co.	13-20-26	2,770	hd. sd. drilling
Fort Wayne Synd., No. 1 Goodell, Madera Co.	22-16-17	2,250	fishing
Continental Oil Co., No. 2 Smith, Colusa Co.	31-18- 4	3,800	redrilling

TANKER SHIPMENTS FROM LOS ANGELES TO ATLANTIC AND GULF COAST PORTS

Commodity—	Total This Week	Daily Average	Total Last Week	Daily Average	This Year to Date	Same Time Last Year
Crude oil	78,172	11,168	193,165	34,388	9,516,298	10,621,703
Fuel oil	.....	.....	.....	.....	6,788,773	6,805,276
Diesel and gas oil	.....	.....	.....	.....	2,375,151	3,140,798
Gasoline	402,052	57,150	251,013	83,670	8,776,440	6,525,885
Tops	.....	.....	.....	.....	.....	374,504
Coastwise—						
Crude oil	425,776	60,825	559,953	79,993	22,597,578	22,008,197
Fuel oil	438,890	62,697	386,012	55,145	12,476,468	11,066,770
Diesel and gas oil	.....	.....	8,553	1,222	365,413	165,935
Gasoline	116,293	16,615	223,642	71,949	9,334,857	7,328,635
Kerosene	4,653	665	4,618	660	240,072	191,868
Tops	.....	.....	40,120	5,731	259,376	501,520
Exports—						
Crude oil	36,092	5,156	.....	.....	2,174,332	3,833,016
Fuel oil	693,525	99,075	689,440	96,777	26,663,260	17,396,986
Diesel and gas oil	27,767	3,967	42,860	6,123	1,334,901	532,630
Gasoline	224,623	32,089	223,144	71,878	5,048,770	3,397,187
Tops	.....	.....	.....	.....	302,303	194,642
Kerosene	112,910	16,130	25,365	7,624	2,091,742	2,646,482

TANKER SHIPMENTS FROM SAN FRANCISCO TO ATLANTIC, GULF COAST PORTS

Fuel oil	.....	.....	.....	.....	.....	78,653
Diesel and gas oil	74,975	10,711	.....	.....	975,036	1,915,670
Gasoline	.....	.....	.....	.....	2,042,773	1,028,368
Tops	.....	.....	.....	.....	.....	73,698
Lubricants	.....	.....	.....	.....	439,357	407,860
Coastwise—						
Fuel oil	98,032	14,005	48,780	6,969	4,790,421	5,075,629
Diesel and gas oil	15,150	2,164	.....	.....	238,733	.....
Gasoline	54,144	7,735	71,057	10,151	4,742,818	4,380,627
Kerosene	3,129	447	.....	.....	216,238	301,764
Exports—						
Fuel oil	45,729	6,533	98,895	14,142	2,525,932	2,929,037
Diesel and gas oil	107,818	15,403	.....	.....	107,818	.....
Gasoline	.....	.....	.....	.....	2,678,443	1,924,814
Kerosene	50,140	7,163	.....	.....	947,295	1,936,476
Lubricants	34,713	4,959	.....	.....	61,408	66,706


Prick-Reid

Celina Field in Tennessee Is Busy

Ohio County, Kentucky, Only Other Active Spot in the Two States. Much Wildcatting in Progress

By Whit
Staff Correspondent, Kentucky-Tennessee

BOWLING GREEN, Ky., Dec. 19.—Only two areas of the Kentucky-Tennessee Field showed any activity to speak of during the week. In the Kentucky end the bulk of the new work completed centered in Ohio County and in Tennessee, Clay County made a very good showing. Other sections of both states were very quiet and the holiday season will not see much work, although the Tri-County area of the western division of Kentucky is destined to remain active throughout the entire winter season, or as long as material can be moved over the area.

It is surprising the attention that has been drawn to the territory in Ohio, Daviess and McLean Counties in the western part of Kentucky and leases are usually taken on short drilling terms, which means that wells must be drilled to hold the acreage, much of which looks worth testing. The finding of the rich Ambrose Pool in Ohio County, followed by good production in the Sunnydale Field of the same county, is the cause of the present excitement in the way of wildcatting over a large area. The finding of an excellent oil well by the Dimmick Brothers in October on the Ratliff lease in McLean County, at that time about 15 miles ahead of production, brought attention to McLean County and since then thousands of acres have been blocked by numerous operators who are now moving in material for wells or getting ready to start operations. After the Dimmick well, which is said to be good for 80 bbls. a day, was brought in, it was followed by a new well on the Hayden lease in the southern part of Daviess County several miles from the Dimmick well and between that and production. This well caused quite a flurry and many leases were taken, some lands purchased in fee simple, royalty interests sold and leases commanded good prices close up to either of the two wells, and some distance away or between the two wells the average price for leases ran from $15 to $18 per acre. The Hayden well was followed by another wildcat 4 miles south of the Hayden well and some few miles from the Dimmick well and located in Ohio County, almost directly west of the Ambrose Pool something like 7 miles. This well was drilled on the Jolly lease and was estimated good for 50 bbls. initial production. Then comes the territory to the southeast of the Ambrose Pool, and between there and the Sunnydale Field, where the second well on the big Hamilton lease is showing for as good a producer as the initial well, which did 200 bbls. initial. It is the wildcat work that has attracted attention and the towns are full of oil men, operators, scouts and leasers.

Tennessee comes to the fore with some new completions, although not large wells, good substantial producers, with the oil found at very shallow depths, the wells running from 8 to 30 bbls. In most cases the oil is found a short distance below the Pencil Cave. One of the shallowest of the late completions was that of the Carnahan Oil Co., on the J. L. Murdock lease, which found its oil in the Fannie's Creek sand at 180 feet. The initial production was 20 bbls.

From now on the Celina Field in Clay County, Tennessee, should see a greater amount of oil moved as the Paragon Development Co. has made additional connections to its line and the Stoll Oil & Refining Co. has hooked to the production of the Ohio Oil Co. in the Mill Creek Pool in Clay County.

Pipe Line Runs

According to the four pipe line companies handling crude in Kentucky that make their monthly reports, there was a total of 523,863.48 bbls. handled through the four systems in November. The runs from the eastern division totaled 273,995.04 bbls. for the five-week period from November 5 to December 3. The western division runs totaled 249,888.44 bbls., including the Stoll Oil & Refining Co.'s runs estimated at 15,000 bbls., from the Barren County Field.

The runs of the Cumberland Pipe Line Co. for November amounted to 273,995.04 bbls. The runs for the week ending November 5 were 56,740.05 bbls.; week ending November 12, 52,708.35 bbls.; week ending November 19, 51,068.35 bbls.; week ending November 26, 56,332.36 bbls.; week ending December 3, 57,025.93 bbls.

The Illinois Pipe Line Co. handled through its western Kentucky lines a total of 209,594.68 bbls., a gain of 2,555.21 bbls. over the October figures. The bulk of this big production comes from the Ohio County Field.

The Paragon Development Co.'s runs for November from Barren County amounted to 18,346.36 bbls., and from Monroe, Cumberland and Clinton Counties, 6,947.40 bbls., or a total of 25,293.76 bbls.

The Paragon Development Co. ran in November from Clay County, Tennessee, 3,272.45 bbls., and recorded no runs for the month from Pickett County, making the company's total runs from the two states for November 28,566.21 bbls., a gain of 790.29 bbls. over the October runs.

Week's Work

A summary of the week's work in the Kentucky-Tennessee fields shows 23 completions, 16 producers with an initial production of 725 bbls., 6 dry holes and 1 gas well. Compared with the previous week, there were 6 more completions, 7 more producers, 179 bbls. more production, 3 less dry holes and the same number of gas wells. The wells were distributed by counties and districts as follows:

County—	Oil Comp.	Wells	Prod.	Dry	Gas
Ohio	9	7	550	2	1
Warren	1	1	2	0	0
Allen	1	0	0	1	0
Clay	1	0	0	0	0
Wayne	1	0	0	1	0
Kentucky	13	8	552	4	1
Tennessee	10	8	173	2	0
Total	23	16	725	6	1
Last week	17	7	546	9	1
Difference	6	9	179	3	0

Eastern Kentucky

But two completions were reported from the eastern division of Kentucky for the week. Operations are on the decline in this division and little will be accomplished until the spring season opens up.

In District 3, Wayne County, John Dillon's test on the Foister heirs farm came in a dry hole.

In the Crane Creek area of Clay County, the Petroleum Exploration Co.'s test on the Crawford heirs farm, is reported a very good gas producer and not far distanced from where C. R. Dulin found a nice gasser in November on a block of leases near the Burning Springs, in the same county. It looks very much as though Clay County would be developed into another good gas producing area. This county lies directly south of Owsley County, where the Petroleum Exploration Co.'s new line was constructed to Lexington and other intervening points and which has already started furnishing fuel for the towns. This means that if the Clay County Field is worth while an extension from the Owsley County line may be made to handle the gas through the same system to Lexington and other points.

Western Kentucky

The only thing that will keep development work quiet during the winter will be bad roads and inability to move material. At this time drilling rigs are moving to new locations, but are having considerable trouble, because of their weight and the softness of the earth now that rains and freezes and thaws have heaved the soil. It was with a great deal of difficulty the rig was moved on the Dock Baird farm, as the location of the test was a long distance from the highway, and the rig was heavier than the usual outfit in the field. Work has already started on the Hock Baird farm on the Hartford Road from Owensboro. This farm is at the first bridge on the way out of Owensboro on the Hartford road, where the highway turns directly east and the road toward the west heads to the Hayden well. It is believed this well should hit into the pool of the Hayden well, although somewhat north of it. Another well of interest is that on the Boyd Bristow farm, south of Owensboro, which will determine considerably to what extent the Hayden-Dimmick Pool will be developed. This is in Daviess County, and a second well is starting on the Hayden farm upon which the good well was drilled recently into pay sand and stakes have been set for two addi-

(Continued on Page 84)

FEW COMPLETIONS IN CENTRAL WEST; WEATHER CONDITIONS HALT WORK

By Whit
Staff Correspondent, Central West

FINDLAY, Ohio, Dec. 17.—But few completions were reported from the Central West Field for the week and those that were finished were well scattered. Weather conditions are against development work, rain making high waters, snow and sleet, and it means almost a shutdown. Indiana Field led in new completions with 7 wells, 4 dry, 2 gas, 1 producer with an initial of 20 bbls.; Lima Field, 1 well and 30 bbls.; Illinois 2 wells and 29 bbls.; Central Ohio, 2 wells dry; and Michigan, 1 gas well, making a total of 13 completions, 6 dry holes, 3 gas wells and an initial production of 79 bbls. from the four producing wells.

Lima Field

Only one well was reported completed in the old Lima Field of northwestern Ohio, and that is a test drilled by the Carman Oil Co., 250 feet from the north line and 750 from the east line of the Martha J. Powell farm, in the SW of Section 13, Bath Township, Allen County, northeast of Lima and between Lima and Findlay along the Dixie Highway. Top of Trenton sand in this well was found at 1,371 feet and drilled 50 feet in the sand to a total depth of 1,421 feet. This territory, which was overlooked to a large extent in the early days of development, is now showing some of the best wells found in any portion of the Lima Field outside of some of the recent wells found in wildcat territory in Auglaize County. The Powell well produced 30 bbls. initial when put on the pump.

Indiana

The only oil well completed in the Indiana Field was found by Hartman & Sargent in their second test in the southwest corner of the Alonzo Veale farm, in the southwestern part of the state. Two sands were encountered in this well, the first at from 1,138 to 1,146 feet the second sand at from 1,285 to 1,305 feet and drilled to a total depth of 1,318 feet and shot with 60 quarts, making an initial production of 20 bbls. The No. 3 well drilling by T. H. Danver on the J. C. Allison, Section 35, same township, is shut down on account of bad weather and high water.

Gray, Morrisey and others found a slight showing of oil in a second test on the Margaret A. Mauck, Section 29, at a depth of 1,568 feet but not enough to make a commercial producer, and it has been abandoned. This well is in Washington Township, Gibson County.

J. Morrisey and others failed to get a producer at a test 135 feet from the south and east lines of the William Miley farm, in the NE of Section 14, Logan Township, Pike County, at a depth of 800 feet where a bad fishing job took place and the hole has been abandoned at that depth, being unable to remove the tools.

Hackett, Clark and others' second well on the E. G. Carrithers, Section 29, Turman Township, Sullivan County, is a duster.

In Loogoottee Township, Martin County, Ruark and others' test on the McConn farm, south of the town of Loogoottee, failed to find the expected gas pocket and goes as a dry hole.

There is a little enthusiasm in Shelby County over the find of a commercial gas well by the Freeport Gas Co. on the David farm, Section 15-14-7, Hanover Township, near the active city of Morristown. The gas was encountered in the Trenton Rock at a depth of 910 feet. Other wells will be drilled in the vicinity in hopes of opening a new gas supply for near-by towns.

In the extreme southern portion of the State, in Boone Township, Harrison County, the Louisville Gas & Electric Co. struck a fair gas well on the Meade Glasgow property in the Dogwood Field, and a dry hole at No. 1 on the Charles Bryant property. The gas in the field is found at close around 700 feet and while the wells are not large they help materially in furnishing gas.

State Report

Oil and gas information from Indiana compiled by T. M. Kingsbury, state gas supervisor, Department of Conservation of Geology, Indianapolis, given in part by counties, follows:

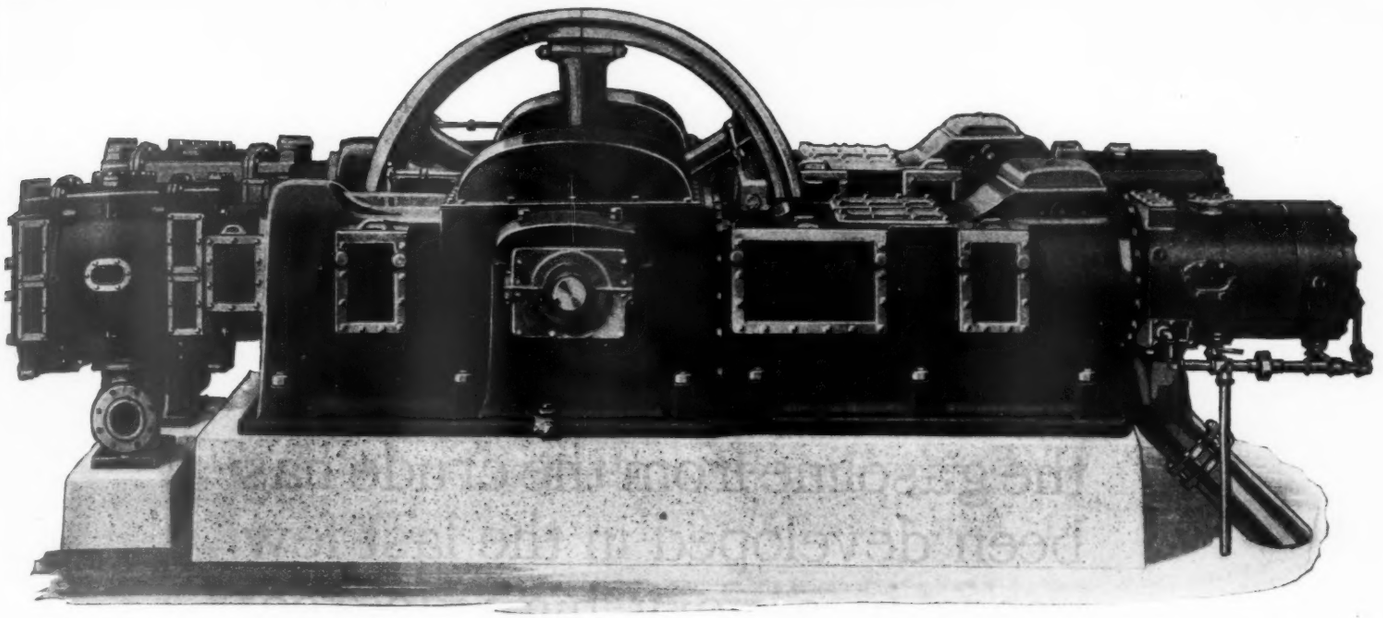
LaGrange County—The last report on the Ivo Chrystler well, northwest of LaGrange, which is being drilled by J. W. Hunt, was that it was down a little more than 1,000 feet. At 895 feet gas at 110-pound pressure was encountered.

Martin County—The well drilled by Ruark and others on the McConn farm, south of Loogoottee, is reported dry. Drilling on the test well on the Luther Hurt farm, 4 miles north of Indian Springs, has been abandoned temporarily. The well is down about 500 feet.

Randolph County—Wesner and others are drilling a test on the Joseph Meeks farm, Monroe Township, close to old production southwest of Parker City.

Shelby County—The Freeport Gas Co. brought in a good gas well on the David

(Continued on Page 103)



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to the consumption of less crude by our refineries, and I think here lies the hope in this regard for conservation of all our oil resources. This would be practical conservation, resulting simply from the operation of economic law."

Extract from a paper addressed by Mr. F. C. Proctor to Mr. E. W. Clark, President, American Petroleum Institute, and appearing in the October 20, 1927 issue of The Oil and Gas Journal

Universal Oil Products Company
Owner of the Dubbs Process
310 South Michigan Ave
Chicago, Illinois

Scenery Hill Completions Are Light

Development Work Falling Off Materially and Little New Work Starting in Washington County, Pa., District

By D. S. Wakenight
Staff Correspondent, Eastern Fields

PITTSBURGH, Pa., Dec. 19.—Since the eastern fields were last reviewed, no large wells found their way into the completed list. Added to this poor showing fewer wells of any kind were completed. All considered it was one of the dullest weeks recorded in many months. It is quite certain that operations in the eastern fields will go into the new year without the discovery of a new pool. The only discovery in the southwest Pennsylvania fields was the gas pool at Scenery Hill, East Bethlehem Township, Washington County. It has been defined and all late completions have come in so light that development work has fallen off very materially and little new work is now starting.

As for test work there is very little starting in any section, the most located in West Virginia. Under present conditions there is nothing for the producer to do but keep the old wells pumping and producing to their full limit. In many districts to leave them stand inactive would be equivalent to abandonment. The steady demand for crude of the Pennsylvania grade is the only encouraging feature at this time.

Some Fair Producers

In the southeast quarter of Section 20, Westland Township, Guernsey County, Ohio, Davis Brothers Co. completed in the Niagara lime No. 3 on the Paul Micha farm. It is a natural producer and produced 50 bbls. the first 24 hours after drilled into the pay at a total depth of 3,460 feet. In the southwest quarter of Section 15, Jackson Township, same county, the Ohio Fuel Supply Co.'s No. 7 on the W. C. McCourt farm produced 40 bbls. the first 24 hours after drilled into the same formation.

In the southwest quarter of Section 21, Westland Township, Guernsey County, the Pure Oil Co. has drilled a second test on the D. D. Rigley farm into the Niagara lime it is a natural producer and produced 65 bbls. the first 24 hours from a total depth of 3,465 feet.

In the northeast quarter of Section 20, Westland Township, the Leonard Oil & Gas Co. completed in the Niagara lime No. 6 on the John Joyce farm. The well produced 70 bbls. the first 24 hours from a total depth of 3,742 feet.

In the southwest quarter of Fallsbury Township, Section 1, Licking County, the Goshen Oil Co.'s No. 7 on the C. E. Vanwinkle farm is a duster in the Berea grit. In Section 15, Licking Township, R. A. Fink and others have the rig completed for a test on the Charles Shull farm. In Section 16 the A. H. Heisey Co. is due in the Clinton sand at a second test on the James Davis farm.

Located 600 feet east of Wright & Co.'s test on the Wright Oil & Gas Co.'s test on the White-Hengst farm, in the SW of Section 11, Washington Township, Hocking County, the Preston Oil Co.'s No. 3 on the E. D. Lockard farm is through the Clinton sand and dry. In Section 35, same township, the Riggs Oil & Gas Co.'s test on the A. S. Riggs farm is also a duster. In Section 23 the Limelight Oil & Gas Co.'s second test on the W. S. Lane farm is a gasser showing a little old in the Clinton sand. In Section 35, Wallsmith & Kinard drilled their test on the William McGlaughlin farm through the Clinton sand and found it barren. A light gas pressure was developed in the Berea grit and filled back that formation and the gas conserved.

Late Completions

In Lot 15, Monroe Township, Holmes County, the East Ohio Gas Co. has completed a second test on the S. R. Williams farm. It is a gasser good for 500,000 feet in the Clinton sand. In Alexander Township, Athens County, the Wehrle Co.'s test on the J. G. and J. B. Allen farm is showing a little oil and gas in the Berea grit.

Two miles northeast of Joy, Section 25, Marion Township, Morgan County, Charles Fox & Co. have completed No. 3 on the L. E. Glass farm. It is a gasser in the stray sand. One mile east of Joy, same section, the Bowman Oil & Gas Co. has a light gasser in the same formation at No. 3 on the George Huffman farm. In the southeast quarter of Section 31, Sutton Township, Meigs County, the Ohio Fuel Supply Co. is drilling a test on the Nina Webster farm.

In Lot 11, Cambridge Township, Guernsey County, George Jewell and others have a 10-bbl. pumper at a test on the R. P. Lanning farm. In Section 8, Prairie Township, Holmes County, the Ohio Oil Co.'s test on the Jacob E. Miller farm is a gasser. In Section 9, Monroe Township, Coshocton County, the East Ohio Gas Co.'s test on the D. & M. Mohler farm is a duster. The same company is due in the Clinton sand at a test on the C. L. Dalrymple farm. In Section 21, Killbuck Township, the Kemrow Co. has a gasser at No. 3 on the Lloyd Sandles farm.

In Section 19, Knox Township, the Ohio Fuel Supply Co.'s test on the David Moser farm is a duster in the Clinton sand. In Section 23, Mary Ann Township George H. Long has a rig up for a test on the Frank Fulton farm. In Section 2, Fallsburg Township, Licking County, the Arkansas Fuel Oil Co.'s test on the E. C. Howell farm is a 3-bbl. pumper in the Berea grit.

In the NE of Section 11, Green Township, Hocking County, the Chartiers Oil Co. has drilled No. 206 on the Hocking Valley Products Co.'s property through the Clinton sand and showing for a light pumper.

At a total depth of 3,825 feet on the F. M. Ashmore farm, in SW of Section 10, Springfield Township, Muskingum County, the Hunter-Athey Oil Co.'s test is a duster in the Clinton sand.

In Lot 5, Section 14, Chatham Township, Medina County, E. R. Edson, Son & Co. have completed No. 38 on the William P. Wertz farm. It is a duster. In Lot 54, Section 15, same county, the same parties had the same luck at No. 26 on the W. H. Wideman farm.

In Lot 61, Athens Township, Athens County, the Ohio State Oil & Gas Co.'s No. 8 on the Ohio State Lands is a 5-bbl. pumper in the Berea grit. In Section 2, same township, the Wehrle company has a light pumper at a second test on the Claude P. Maxwell farm. In Section 24, the Watkins Oil & Gas Co.'s No. 4 on the Mary Hildred Eathart farm is a 5-bbl pumper. In Section 19, Alexander Township, J. H. Ranshausen & Co. have a 5-bbl. pumper in the salt sand at No. 3 on the J. A. Cassels farm. The Wehrle company has started to drill a test on the J. G. and J. B. Allen farm.

In Section 13, Killbuck Township, Holmes County, the East Ohio Gas Co. has completed through the Clinton sand a test on the J. W. Moth farm. It is a duster. In Section 13, Lawrence Township, Washington County, the Peoples Banking & Trust Co., trustee, has completed No. 20 in the Bergen Oil Co.'s lease. It is a duster in the Keener sand.

West Virginia

In Butler district, Wayne County, West Virginia, the Chartiers Oil Co. has been the most aggressive for several years. It has not succeeded in opening a new pool, but has completed a number of light pumpers. During the week is drilled in a wildcat on the Strebler farm and got a producer good for 5 bbls. a day. Further developments may possibly lead up to something better.

In McClellan district, Doddridge County, Godfrey L. Cabot's test on the N. G. Mayfield farm is a gasser in the Big Injun sand. In Hackers Creek district, Lewis County, the Standard Gas Co. has drilled a test on the V. Rinehart farm through the Benson sand and it is a fair gasser.

In Jefferson district, Lincoln County, the Mud River Gas Co.'s test on the Elizabeth Adkins farm is a gasser in the Berea grit. In Clay district, Wirt County, W. C. Patterson has completed No. 31 on Vernon-Donohoe tract and it is a duster in the salt sand.

Wood County

The Davis Oil Co.'s test on the Rachel McPeak farm, in Walker district, Wood County, is dry in the salt sand. In the same district, the South Penn Oil Co.'s second test on the Nettie M. Dye farm is a very light pumper in the Berea grit. The same company has started to drill a second test on the S. E. Masters farm.

In Center district, Wetzel County, the Carnegie Gas Co.'s test on the Pendleton Miller farm has been drilled deeper and is good for 3 bbls. a day in the Gordon sand. In Center district, Calhoun County, the Hope Natural Gas Co.'s test on the Hardman-Bennett farm is a gasser in the Big Injun sand. In Center district, Gilmer County, the Hope Natural Gas Co. has a gasser in the Big Injun sand at a second test on the C. N. Snodgrass farm. In DeKalb district, the same company's test on the Parsons Bennett farm has been drilled deeper and is a gasser in the Big Injun sand.

Calhoun County

In Lee district, Calhoun County, McIntosh & Co. have a salt sand gasser at No. 3. In Sherman district, W. H. Bickel has a gasser in the Big Injun sand on the Michael Knight farm. In Birch district, Braxton County, the Pittsburgh & West Virginia Gas Co.'s test on the Bennett Oil & Gas Co.'s lease is a gasser in the salt sand.

In the Big Injun sand pool in Henry district, Clay County, the Virginian Gasoline & Oil Co. has completed No. 15 on the Lockhart tract and is a 5-bbl. pumper.

Ritchie County

On Big Run of Bone Creek, Union district, Ritchie County, A. L. Britton and others have drilled a test on the J. A. Hall farm. It is good for 8 bbls. a day after shot. In Murphy district, C. S. Morris & Co. have a Big Injun sand gasser on the A. N. Tingler farm. In the same district, Park Bowser has a gasser in the Maxon sand at a second test on the J. W. Grim farm. In the same district, Captain Davis and others are fishing at 2,000 feet on the Asa W. Flesher farm. On Lease No. 2 of the John A. Bell farm, A. L. Britton and others have a 5-bbl. pumper in the Big Injun sand. In Union district, Clark Braden & Co. have completed in the Big Injun sand a test on the Joseph Moore farm. It is a gasser. In the same district, T. E. Pritchard has a duster in the Big Injun sand at a test on the Lakin Pritchard farm.

In Sheridan district, Calhoun County, the Great Elk Oil Co.'s No. 27 on the Samuel Bachman farm, drilled deeper, is a gasser in the Big Injun sand. Two miles west of Lost Creek, Grant district, Harrison County, the West Virginia Central Gas Co. has started to drill down to the lower sand an old Gordon sand gas well on the W. B. Maxwell farm. One mile east of Wolf Summit, Coal district, the Reserve Gas Co. is drilling down from the fifth sand to the Speechley sand an old gas well on the Hugh Thompson farm.

The Helm Oil & Gas Co. has drilled its wildcat on the L. D. Parsons farm. It is a fair gasser in the Big Injun sand, located in Washington district, Jackson County. In Harper district, Roane County, the Producers Oil & Gas Co.'s test on the David Harner farm is dry and abandoned through the Berea grt.

On Pawpaw Creek, Pawpaw district, Marion County, Victor Tennant has drilled his test on the Jesse Brook farm through the Gantz sand. It is dry in this formation and has been plugged back to the Big Injun sand and the gas developed in that formation conserved. On Finches run, Fairmont district, the Mack Bell Oil & Gas Co. has completed a test on the W. S. Pricket farm and it is a gasser in the Big Injun sand.

On Walnut fork of Clover run, Smithfield district, Roane County, Godfrey L. Cabot has started to drill a test on the Kauffman-Oppenhimer farm. In Lee district, Calhoun County, the Calhoun Oil & Gas Co. is due in the Big Injun sand on the A. J. Nitz farm. In the same district, Godfrey L. Cabot is due in the same formation on the Leona M. Nicholson farm. Locations have been made for tests on the L. H. Booher and A. J. Ferrell farm.

Roane County

In Harper district, Roane County, the National Oil & Gas Co. completed in the Berea grit a test on the D. I. Harner farm. It is a duster. In Spencer district, Godfrey L. Cabot's test on the Emma Hildreth farm is a gasser good for 500,000 feet.

In Lee district, Calhoun County, M. F. Crowley has a 6-bbl. pumper in the salt sand at a second test on the William Sturm farm. In Sheridan district, B. J. Crowley has a gasser good for 500,000 feet in the Maxon sand. In Lee district, F. F. McIntosh has a gasser at a test on the W. H. Slider farm. In the same district, the Hope Construction & Refining Co. has a rig up on the Creed Yoni farm.

On Big Pawpaw Creek, Pawpaw district, Marion County, the Owens Bottle & Machine Co. has a rig up on the Central Coal Co.'s property. In Harvey district, Mingo County, the Old Colony Oil & Gas Co. has started to drill No. 18 on the Closterman estate. In Barboursville district, Cabell County, the Aetna Oil & Gas Co. is drilling a test on the J. W. Lewis farm.

On Leatherbark Creek, Murphy district, Ritchie County, Deem Brothers & Co. have completed in the Big Injun sand No. 3 on the Smith Brothers' farm. It is a light gasser. On Greggton Creek, Butler district, Wayne County, the Chartiers Oil Co. has completed in the Berea grit its wildcat on the A. A. Streuber, good for 3 bbls. a day.

Putnam-Cabell

On Rocky Step Creek, Scott district, Putnam County, 1 mile northeast of the Parker School lot well, the Hurricane Oil & Gas Co.'s test on the Phillip Mitchell farm is a gasser in the Big Injun sand good for 2,000,000 feet a day. On Wildcat Creek, Barboursville district, Cabell County, Charles Shipe and others have completed a rig and started to drill a test on the William Robinson farm.

(Continued on Page 105)

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Natural Gas Developments

PROPOSED CARBON BLACK PLANT IN LOUISIANA CAUSES ARGUMENT

By Neil Williams

The fight to establish a carbon plant in the new Rayville gas district of Richland Parish, eastern Louisiana, is one of the leading topics of interest in this state and promises to develop into one of the bitterest battles ever waged over such plants in the entire country.

Gas line companies and the state Department of Conservation are lined up on one side opposing the establishment of a carbon black plant in the field. The Century Carbon Co., supported by the almost unanimous populace of Richland Parish, is seeking a permit to manufacturer carbon black in the Rayville Field.

To make the matter all the more entangling certain other carbon black companies in the Monroe Field, northeastern Louisiana, are taking the side opposing the building of the Richland plant, although they themselves have had to battle for existence.

May Go to Courts

A real test case may be carried into the courts if the Department of Conservation refuses to grant the permit for the establishment of the carbon black plant. In this case the authority granted to the department to control the use to which gas may be put will be the question at stake. Whatever the decision is it will have an important bearing on the future of the gas industry.

To date there have been no carbon black plants in Richland Parish. If the Century plant is permitted it will be the first and possibly pave the way for others. The application for the permit has been in since early summer and interested parties have been constantly busy amassing arguments pro and con. The application now is waiting decision of Dr. V. K. Iron, director of the Department of Conservation.

The Rayville Field was just a year old this November. According to the semi-annual regauging and survey of wells in eastern Louisiana made by the Department of Conservation, there were 8 producing wells with an open flow capacity of 151,849,040 feet of gas daily in this field up until August. Since then the total number of wells has been swelled to 19, with an open flow capacity of better than 200,000,000 feet daily.

The market and outlet for this gas at present is limited although gas rights and acreage are very much in demand by companies planning gas lines and by several large producing companies. But so far not more than 50,000,000 to 75,000,000 feet of gas is finding its way into commercial use daily. Drilling operations are burning some for fuel; the town of Rayville is piped and is a consumer, and around 20,000,000 feet is being taken daily into Arkansas by the Natural Gas & Fuel Corp. of El Dorado through the old Crusader pipe line which it leased recently from the Continental Supply Co. The big main line of the Interstate Natural Gas Co. from Monroe cuts the field in two, but so far has taken no Richland gas.

Urge Immediate Use

It is upon this fact that proponents of a carbon black plant are basing one of their chief arguments. With so much gas shut in and with additional wells coming in all the time, the Century Carbon Co., as well as some producers and the people of Richland Parish, is pleading that a plant at this time would furnish immediate use for some of the reserves, bringing returns to the producers and much needed tax and pay roll revenue to a sorely distressed and flood devastated parish.

Opposition to the establishment of any carbon black plant in the field, as is always the case in any gas country, is based on the fact that the process of manufacture necessarily is wasteful of the supply. Carbon black, as is known, is obtained through incomplete combustion of gas in furnaces, only a fraction of the gas being deposited as carbon, the remainder passing out the flue as waste.

In the past in this State it has been the policy to issue permits for carbon black manufacture whenever there was no adequate domestic and industrial market in new gas fields, particularly so whenever there was no early demand in sight. In these cases, the carbon black plants were allotted specific quotas, over which these plants must not consume.

This accounts for the extensive carbon black industry in the Monroe gas field in northeast Louisiana, which at present begins about 20 miles northwest of the Richland area. The Monroe Field developed an enormous gas reserve, possibly the largest of any field in the world, but only recently is this district being tapped by major outlets for domestic and industrial consumption of gas.

Also in the case of the Richland district, it has been only in recent weeks that gas has been taken out of the field by pipe lines other than local distributing systems in towns immediately adjoining the field. As was previously mentioned the Natural Gas & Fuel Corp. of El Dorado, Ark., handles around 20,000,000 feet daily through a line laid several years ago to transport Smackover crude to the Mississippi River at Vidalia, La. This line, which passes through both the Monroe and Richland Fields, has been idle since built. The Interstate Natural Gas Co.'s line from Monroe to New Orleans, which also runs through Richland, will have a capacity of between 125,000,000 and 150,000,000 feet of gas daily, but so far Monroe is supplying all the gas it needs, as only enough gas is being taken to supply the Standard Oil Co. of Louisiana refinery at Baton Rouge, a sugar refinery at Reserve and another refinery at Destrahan, which is as far as the line has been completed.

Gas Lines Opposed

Although at present there are not adequate outlet facilities for Richland gas, the general gas situation in Louisiana is different as this new field is developed than it was in earlier days of Monroe. Several major gas line and distributing projects are under construction and nu-

(Continued on Page 109)

COLUMBIA EXPANDING IN KENTUCKY FIELD

Columbia Gas & Electric Corp. has contracted to purchase on December 30 the common stock of General Kentucky Natural Gas Co. through exchange of securities on the basis of one share of cumulative 6 per cent preferred stock of Columbia Gas & Electric for each two and one-fourth shares of common stock (totaling 60,000 shares) of Central Kentucky Natural Gas Co.

The Central Kentucky Natural Gas Co. distributes gas at retail in Lexington, Winchester, Mount Sterling and other communities in Kentucky, with an aggregate population of about 90,000. It has natural gas holdings and pipe lines already interconnected with the properties of the Columbia system subsidiaries in Kentucky and West Virginia, and is a logical addition to the Columbia system. By this acquisition approximately 18,500 additional gas customers will be added to the system.

Discussing current earnings of Columbia Gas & Electric in letter to stockholders, Philip G. Gossler, president, states:

"Earnings from electric operations continue to reflect satisfactory increases each month. The gas earnings have been unfavorably affected by unusually mild weather conditions. In October and November the temperatures prevailing in the system's territory were higher than the official high temperature records of those months for many years past.

OUACHITA NATURAL GAS COMPANY MAKES SIGNIFICANT ACQUISITION

By D. H. Bancroft

SHREVEPORT, La., Dec. 17.—Developments in the natural producing, transporting and marketing business in this territory are following one another with great rapidity these days, and the end is not yet. There is reason to believe that the latest transaction will, eventually, prove to be an item in that greater enterprise reference to which has been made in two or three previous issues of The Oil and Gas Journal. At present, however, detailed information is lacking. This transaction is acquisition by the S. S. Hunter estate, operating as the Ouachita Natural Gas Co., of the remaining quarter interest in the Louisiana-Arkansas Pipe Line Co. of which it already had control, and of the El Dorado Gas Co. and its holding company, the Central States Gas & Electric Co., a Ross Morgan property.

The Hunter estate, with Sam D. Hunter president of the Ouachita Natural Gas Co., as manager paid $1,350,000 for the Morgan properties, chief of which is the El Dorado Gas Co. Several months ago Hunter and Morgan got together and organized the Louisiana-Arkansas Pipe Line Co. for the purpose of building a gas line from the Monroe Field, where the Ouachita Natural Gas Co. has extensive holdings, to El Dorado and Camden, Ark.

Right then began considerable conjecture as to what it was all about as last January Harvey Couch, of Pine Bluff, Ark., head of the electric light and power interests who are cobwebbing North Louisiana, Arkansas and Mississippi with high tension transmission lines, through Judge T. J. Gaugham, of Camden, Ark., obtained a permit from the Arkansas public service authority for a pipe line from Monroe to Camden and about the time Morgan and Hunter announced their project came out with annauncement of a similar proposition. One $5,000,000 pulp and paper mill at Camden, which both projects announced as their incentive, was, on the face of it, not enough to warrant duplication even with incidental service to the several communities within easy reach as an additional incentive.

The result is acquisition by the Hunter interests of the Couch project, so far as it has gone, at the same time they got the Morgan property. Consequently the Couch interests will stay in the electric light and power business while Hunter gets the south central Arkansas gas industry. But there is something else beyond that. Supposition is that Hunter will in the end tie up with the larger project referred to in the opening paragraph, but what his plans are he said he is not ready to reveal.

Louisiana-Arkansas Pipe Line Co. got busy on construction with remarkable celerity after announcement of its project and 55 miles of 16-inch line from Monroe Field to El Dorado city limits is complete except for a short gap that will be closed during the next few days. Several miles of the 12-inch line planned by the Couch interests have been built and will be tied into the Louisiana-Arkansas' 16-inch line at El Dorado and the project will be completed when the Louisiana-Arkansas ties these two stretches into a line from Smackover to White City, 3 miles south of Camden, built by Houston Oil Co. several years ago to supply fuel to its refinery at the latter point. Hunter got this line a couple of weeks ago, the pur-

(Continued on Page 100)

LONE STAR RECAPITALIZATION

DALLAS, Tex., Dec. 17.—Directors of the Lone Star Gas Co. have called a meeting of stockholders to approve a plan of recapitalization that will increase the authorized capital stock from $30,000,000 to $50,000,000. Subscription rights for stockholders are expected.

L. B. Denning, president of the company, was quoted as saying control of the company had not been sold and was not for sale.

Of the $30,000,000 of $25 par capital stock now authorized the company had $26,959,925 outstanding on March 31. Stockholders of record of August 20, 1926, had the right to subscribe for new stock to the extent of 20 per cent of their holdings at $25 a share.

LONE STAR GAS LINE

BROWNWOOD, Tex., Dec. 17.—An order for 10-inch pipe has been placed by Lone Star Gas Co. for 75-mile natural gas pipe line from Valera to Brownwood. Shipment will be made immediately.

GAS ACREAGE TO WELL

The United States Geological Survey says that natural gas producers carry an average of 313 acres for each producing well. In most cases they lease these acres. Sometimes they own them outright.

GAS CONVENTION MAY 6

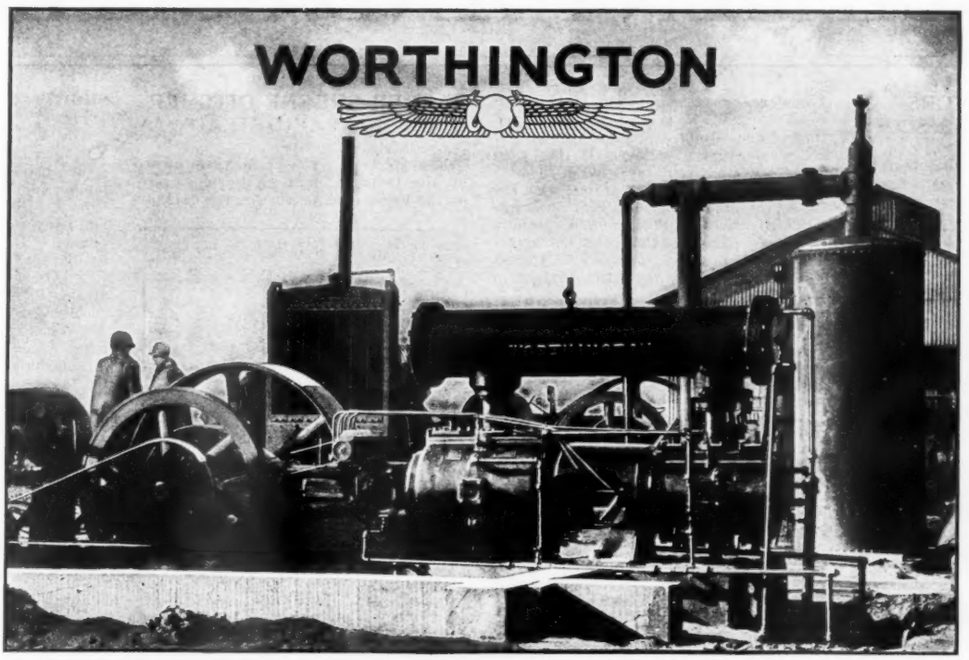
The annual convention of the Natural Gas Department of the American Gas Association will be held in Dallas, Tex., May 6, according to an announcement sent to members. This meeting is expected to attract natural gas company executives and other members of the association from all sections of the United States.

IOWA METERMAN COURSE

The Iowa State College of Agriculture and Mechanical Arts, Ames, Iowa, division of engineering, held its short course for gas metermen, December 6 to 9 inclusive. The course is similar to that put on each year for companies operating in the Mid-Continent gas fields, by the engineering school of the University of Oklahoma with the co-operation of the Oklahome Utilities Association and the Oklahoma Corporation Commission.

COLONEL BURRELL NAMED

Col. G. A. Burrell has been appointed to the chemical committee of the American Gas Association.



Two-stage, high-pressure FEATHER Valve Air Compressor, size 10 in. x 4¾ in. x 12 in., installed at Skelly Oil Company, Johnson Lease, near Borger, Texas.

Air-Gas Oil Pumping

WORTHINGTON PRODUCTS

-:-

PUMPS

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COMPRESSORS

-:-

CONDENSERS *and* AUXILIARIES

-:-

OIL *and* GAS ENGINES

-:-

FEEDWATER HEATERS

-:-

WATER *and* OIL METERS

-:-

Literature on Request

This compressor has been designed especially for the oil fields and is suitable for either permanent or semi-permanent installations. Mounted upon skids, it is easily transported from one location to another with a minimum of trouble and without injury to the machine.

It can be driven by electric motors, gas or oil engines and is adapted to belt drive, short coupled or otherwise.

A complete line of Worthington FEATHER Valve Compressors has been developed to meet all conditions in the oil-field and the most commonly used sizes are available for immediate delivery from Tulsa stock.

Oil Field Specialists at

Tulsa, Okla.	Worthington Machinery Corporation of Okla.
Borger, Texas	Western Supply Company
Houston, Texas.	A. M. Lockett & Company, Ltd.
Dallas, Texas	A. M. Lockett & Company, Ltd.
New Orleans, La.	A. M. Lockett & Company, Ltd.
Los Angeles, Cal.	Worthington Company, Incorporated

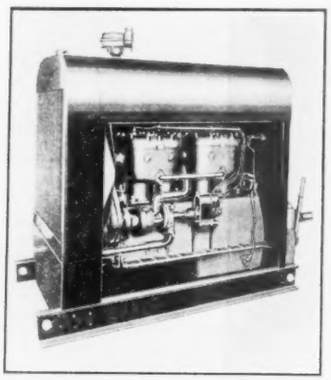
6735-5

WORTHINGTON PUMP AND MACHINERY CORPORATION, 115 BROADWAY NEW YORK, U. S. A.

EQUIPMENT AND SUPPLIES

CONTINENTAL MOTORS CORP. WIDENS SCOPE

Continental Motors Corp. has been active this year in widening its scope in the industrial field, with the result that



a larger number of industrial manufacturers can now apply heavy duty Red Seal industrial engines and power units to their equipment.

The new developments are known as the "A" series. Several new engines as well as the complete industrial series with a power range of 5 to 96 horsepower will be displayed at the Road Show to be held in the Public Auditorium in Cleveland, Ohio, January 9 to 13 inclusive.

The "A" series consists of a transformation of several of the well-known Continental industrial power units, changing the entire housing to lesser dimensions, for the purpose of making them more compact as well as to increase their potential market.

Among several new Continental industrial power units added to round out the Continental series is the Model P-52. This consists of a heavy-duty four-cylinder vertical head type engine with a 5-inch bore and 6-inch stroke, making it the largest of the Continental fours. The total piston displacement is 471.2 cubic inches, total for four. It is a slower speed engine capable of developing 52.5 horsepower at its governed speed of 1,100 r.p.m.

Several departures from regular-known Continental practice in motor design and construction will also be displayed in the form of a six-cylinder overhead valve series. These are built exclusively to serve both the commercial and industrial fields.

Continental powered installations covering practically the entire diversified industrial field will be on display throughout the show, and performing.

STEAM TRAP SOLVING SALT WATER PROBLEM

The ordinary steam trap may prove the answer to the salt water problem in the Cartersville gas field of northern Bossier Parish according to results from experiments using it in siphoning wells in which salt water has appeared in alarming proportions. A committee appointed at a meeting of Carterville operators with W. F. Chisholm, of the Louisiana Department of Conservation is expected to recommend use of the steam trap in a formal report to be made soon, and meanwhile several wells have been equipped with it and satisfactory results have been obtained.

However, solution of the problem of getting the water out of the holes without too large a waste of gas leaves the operators with another on their hands, a problem which is just now worrying the Louisiana-Arkansas division of the Mid-Continent Oil & Gas Association, and this is disposition of the water when it is brought to the surface. If they turn it loose to find its natural outlet farmers are not slow to register a protest with the Conservation Department that drainage from the field is killing fish, ruining crops, etc. The Mid-Continent Oil & Gas Association met this situation in Cotton Valley and is wrestling with it again in Urania.

The steam trap which, made part of the installation for siphoning wells, becomes an automatic drip, was demonstrated to the operators' committee on low and high pressure wells in the Monroe gas field and it worked equally well in both cases.

BUSINESS NOTES

The Iverson Tool Co., of Tulsa, has opened a rental tool shop in Iraan, Yates Pool, Pecos County, Texas.

The Garlock Packing Co. has moved its Tulsa sales office and warehouse from 206 East Third Street to larger quarters at 421 East Fourth Street.

A patent has been issued to S. P. Tschappat, general manager of the Hercules Tool Co., on a tubing rotator designed to rotate the tubing in a pumping well, preventing the rods from wearing or cutting through the tubing. The Hercules Tool Co., it is reported, will manufacture this device.

Earl Van Buskirk, who formerly represented the Butler Manufacturing Co., of Kansas City, Mo., in the Missouri territory has been transferred to a territory that comprises the eastern part of Kansas and southeastern Nebraska. Carlos J. Ford who formerly was in the Arkansas and northern Louisiana territory will have charge of Mr. Van Buskirk's old Missouri territory. W. R. Adams will take over Mr. Ford's former territory.

The G. A. Burrell Co., now the Burrell-Mase Engineering Co., has installed absorption towers and stills of its own design in gasoline absorption plants of the United Fuel Gas Co., the Equitable Gas Co., the Manufacturers Light & Heat Co., and the Carnegie Natural Gas Co., all with headquarters in Pittsburgh, Pa. These stills are of improved bubble tower design.

Norman F. Kimball has been appointed manager of advertising of the American LaFrance & Foamite Corp., a combination of the American-LaFrance Fire Engine Co., and the Foamite-Childs Corp. Mr. Kimball has been successively assistant hydraulic engineering at Underwriters' laboratories in Chicago, chief engineer of the former O. J. Childs Co., and assistant general sales manager of the Foamite-Childs Corp.

TO MOVE DALLAS OFFICE

The A. O. Smith Corp., of Milwaukee, Wis., effective January 1, will move its Dallas offices to Houston, Tex. The new offices will be in the Esperson Building and will be in charge of J. R. McCrea.

RIG & REEL STEPPING OUT

The Parkersburg Rig & Reel Co. is planning to double the size of its cheery little magazine, the Rig & Reel, and add two more colors to its present dress of green and white; also to print more articles of interest to the oil fraternity from the "human interest" angle.

CELITE OFFICE IN NEW HOME

The Chicago office of the Celite Products Co. has been moved from 53 West Jackson Boulevard to the company's own building at 225 East Superior Street.

BARBER-GREENE DITCHER MAKING RAPID HEADWAY

Five Barber-Greene Co. ditchers owned by the Ozark Pipe Line Corp. are reported to be digging an average of 5,000

feet each daily on a line from McCamey, Tex., to Alton, Ill. They are operated 10 hours a day.

The Barber-Greene ditcher is distinguished as a vertical-boom machine. It mills its way through the ground, cutting through stone, shale and frost to a depth of 18 to 24 inches. It is a common thing to see one of these ditchers digging through brick and hard-surface pavement.

The Barber-Greene ditcher is all steel, with the exception of the engine, and it is equipped with a safety release sprocket to eliminate breakage and to protect unseen water and gas pipes in its line of digging. The machine is of the full crawler type and can be turned easily on a flat car. It has a speed of 2 miles an hour on the road. The buckets are self-cleaning and the cleaning device is always in place.

As the machine is 7 feet 2 inches wide and 14 feet long, two can be loaded on a car, effecting a saving in freight for the pipe line contractor. Fifty-seven are employed on pipe line projects in Texas. The Barber-Greene ditchers dig a trench 18, 21 or 24 inches wide and 4 feet deep and are capable of a working speed of 600 feet an hour.

BELTING COMPANY HAS NEW REPRESENTATIVES

The Victor Balata & Textile Belting Co., manufacturer of Petrol belting and Victor balata belting for oil-well pumping and drilling, has announced new oil field connections for the distribution of its products.

The Jarecki Manufacturing Co., St. Louis, Mo., will act as direct representative in northern Texas, Oklahoma, Kansas, Indiana, Ohio and Pennsylvania, carrying complete stocks at branch stores and at all important distributing points. The Petroleum Supply Co. of Houston, Tex., will act as direct representative in the Gulf Coast, Arkansas and Louisiana, also carrying complete stocks at all important distributing centers.

The Petrol and Victor balata belts are well known in the oil fields. The Victor Balata & Textile Belting Co. also manufactures oil field specialties, such as valve discs, belt clamps, belt stretchers, belt punches and pulley lagging.

SHORTT PUMPING TRAP BOUGHT

The W. B. Connor Co., Inc., of New York, makers and distributors of Ace steam traps, Ace air filters and Dubus pumps for viscous liquids, has acquired from the Stebbins Engineering & Manufacturing Co. all rights, patents and interests in the Shortt pumping trap. The company announces it is prepared to provide this trap for pumping high temperature fluids, such as oil, condensates, gasoline, acids, etc.; for draining condensers, dry kilns, blast coils, vacuum pans, water heaters, receivers, paper-drying machines and similar equipment, and for feeding boilers.

AMERICAN RADIATOR AND AMERICAN BLOWER MERGE

The recent merger of the American Blower Co. and the American Rediator Co. brings together two of the oldest and best equipped companies engaged in the manufacture of heating, ventilating, air conditioning and mechanical draft apparatus and allied lines, forming what is believed the largest concern of its kind in the world. It is reported that each company will operate much the same as it has in the past, as to name, personnel, business methods and management, the merger making possible important economies in buying, marketing and manufacturing.

The executive offices of the American Blower Co. are in Detroit. Manufacturing operations are carried on in Detroit and Cincinnati. Sales offices and agencies are maintained in principal cities.

The general offices of the American Radiator Co. are in New York City, general sales and manufacturing offices in Buffalo, and western executive office in Chicago. The main plant is in Buffalo, with branch plants in about a dozen cities. Sales offices and agencies are maintained in the larger cities of the United States and Canada, and in many foreign countries.

E. L. DOHENY HEADS EQUIPMENT COMPANY

E. L. Doheny, according to a permit issued by the California State Corporation Department, has organized the Doheny Stone Drill Co. to manufacture engines, rotary drills, compressors, castings, pipe motors and other equipment used in oil drilling.

The company is taking over the business of the Stone Drill Co. Enlargement of the plant is said to be among the plans of the new concern.

Capital structure calls for 100,000 shares of no par value stock, 40,010 shares of which are to be issued. No offering is to be made to the public, according to the application, but all is to be issued to the officers and directors of the Petroleum Securities Co., and the Stone Drilling Co.

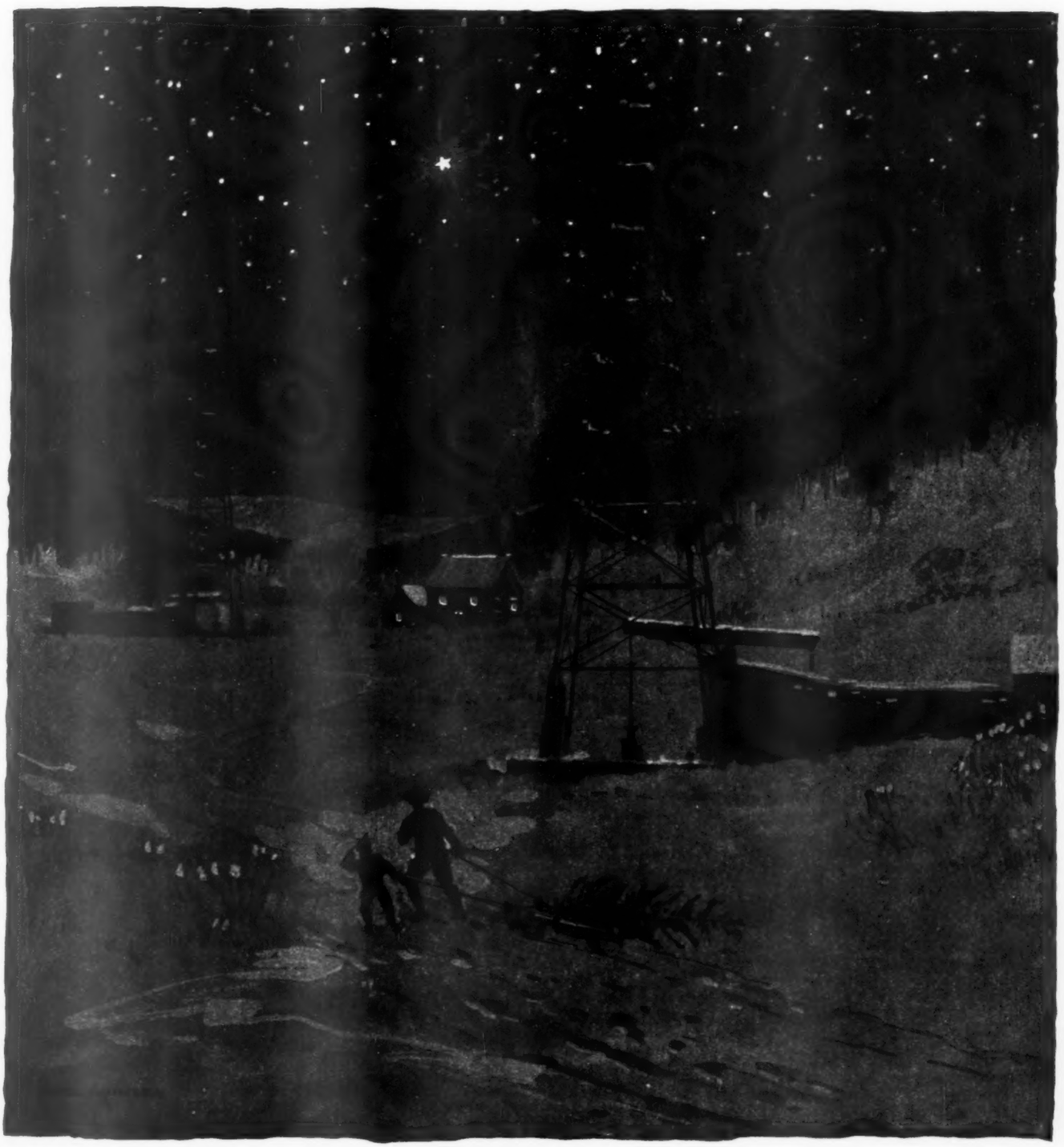
Officers are E. L. Doheny, president; E. L. Doheny, Jr., R. R. Bray, Fred Stone, King C. Gillette, vice presidents; R. N. Sands, secretary, and Fred Witter, treasurer. R. A. Silent is chief executive engineer.

The first unit of the new manufacturing plant at Torrance, Calif., ground for which has been broken, will cost in the neighborhood of $250,000, according to officials of the concern, that amount not including machinery and equipment.

The plant is scheduled to be completed about February 15 and will be placed in operation soon afterward with 250 employes.

A site comprising 41 acres in the southerly part of Torrance, was selected for the new plant.

Merry Christmas



Moore
TUBULAR STEEL DERRICKS

LEE·C·MOORE & CO·INC·PITTSBURGH·TULSA

MEN KNOWN IN OILDOM

Joseph B. Elam

Joseph B. Elam has been secretary of the Louisiana-Arkansas division of the Mid-Continent Oil and Gas Association since it was created in 1922 as a separate entity and divorced from the Texas division.

When the Homer, El Dorado, Haynesville and Smackover developments made it desirable that the industry in that territory be more definitely organized as to its representation in the association, Mr. Elam, then secretary of the Southern Tariff Association, was weaned away from that organization in 1921 to become assistant secretary of the Mid-Continent association for Arkansas and Louisiana under Howard Bennette, now managing director of the Western Petroleum Refiners Association. The next year the Louisiana-Arkansas division was created and Mr. Elam made secretary.

Starting his career as one of the owners and editor and publisher of a small town weekly newspaper, he followed the course of many newspaper men and got into politics. He was elected mayor of Mansfield, La., seat of DeSoto Parish, on a street paving platform, and was retained in office for two more terms to finish his program.

In his five years as secretary of the division he has been the guide for the industry in legislative matters, there being many instances where inimical legislation was defeated and others of a constructive nature were enacted by the legislatures of Arkansas and Louisiana.

One of the biggest things accomplished by the division since it was created was "Oil and Gas Industry Day" at the Louisiana State Fair in 1925, which, coming at a time when the industry was suffering from ills within and without, presented the public with a graphic presentation of what the industry really is and how many thousands in these two States are directly or indirectly dependent upon it.

Mr. Elam conceived the method of presenting the oil industry's case and gathered and prepared the great mass of statistical data presented in placards on the floats and for many of the special articles in newspapers which gave further publicity to the real facts of the oil business.

Mr. Elam is a native Louisianan.

PERSONAL PARAGRAPHS

Walter Wyman has removed from Washington, Ind., to Farmersburg, Ind.

* * *

D. R. Brown, vice president, Oil Country Specialties Manufacturing Company, of Coffeyville, Kans., was a Fort Worth, Tex., visitor.

W. H. Rockman, of Berkeley, Calif., has moved to Toledo, Ohio.

* * *

L. L. Malone has removed to Ventura, Calif., from Fullerton, Calif.

* * *

A. K. Wilhelm has moved from Shawnee, Okla., to Bartlesville, Okla.

* * *

R. B. Hammerly has removed from Shawnee, Okla., to Carnegie, Okla.

* * *

Arnold S. Bunts has removed from Shawnee, Okla., to Fort Stockton, Tex.

* * *

E. C. Disel, of Williamsburg, Ky., is spending the winter at St. Petersburg, Fla.

* * *

H. J. Weeks, with the Sun Oil Company at Shreveport, La., has moved to Dallas, Tex.

* * *

E. P. Dillman, of the Wyatt Metal Boiler Works, of Dallas, Tex., is a Gulf Coast visitor.

* * *

J. H. Page, of the Southern Gas Company, has moved to Chanute, Kans., from Iola, Kans.

* * *

C. E. Capito, of the Anglo-Persian Oil Company, has left Hythe, England, for Ahwaz, Persia.

* * *

C. W. Williams has been transferred by the Skelly Oil Co. from Waterloo, Iowa, to Mobile, Miss.

* * *

R. S. Lenge with the Skelly Oil Company, formerly of Fort Scott, Kans., is now in Kansas City, Mo.

* * *

E. H. Wright, president of the Sun-Ray Oil Company, is back in Tulsa, Okla., after a trip to New York.

* * *

W. P. Scheur left San Jose, Calif., last week en route to Pangkalan Brandan, Sumatra, Dutch East Indies.

* * *

J. W. Finnegan, New York City, president of the Tuscararo Oil Company, Ltd., was a Pittsburgh, Pa., visitor.

* * *

M. O. Danford, tax commissioner for Midwest Refining Company, has returned to Casper, Wyo., from Montana.

* * *

Waite Phillips, chairman of the board of the Independent Oil & Gas Company, is visiting in Washington, D. C.

* * *

J. H. Galloway, of the De La Vergne Machine Company, has returned to Kansas City, Mo., from San Francisco, Calif.

* * *

H. W. C. Prommel, geologist of Denver, Colo., is completing some field work in the Green River Desert area, southeastern Utah.

* * *

J. F. Cullen, superintendent at Laramie, Wyo., of the Midwest Refining Company plant, visited the Casper, Wyo., headquarters recently.

* * *

Clay Briggs, chief engineer of the Empire Companies, and his assistant, Earl V. Kessinger, were business visitors in Kansas City, Mo.

* * *

Charles T. Lupton, geologist, of Denver, Colo., visited in Lingle, Wyo. Mr. Lupton was returning to Denver from the Mule Creek Field.

* * *

Clarence A. Leeper, well-known oil operator of Owensboro, Ky., is spending a few days in Oklahoma where he is interested in a well.

* * *

William Calder, of the federal petroleum and natural gas staff at Calgary, Alberta, has left for a six weeks' trip to the United Kingdom.

* * *

Gen. Burke H. Sinclair, head of the department of industrial relations of the Midwest Refining Company, delivered an address on industrial relations at the University of Colorado at Boulder.

* * *

Joe S. Sidwell, of the Prairie Oil & Gas Company land department has made a trip through North Texas and is back in Tulsa, Okla. Harry L. Norris, chief scout of the Prairie, made an extensive trip over the West Texas fields.

James Hughes, of the White Eagle Oil & Refining Company's land department, is back in Tulsa, Okla., after a trip through North Texas.

* * *

W. J. Cheley, president of the Zero Hour Torpedo Company, is visiting in Denver, Colo., and expects to return to Tulsa, Okla., about January 1.

* * *

H. L. P. Van Sant, secretary-treasurer, Kentucky Oil Producing Company, of New York, spent a few days visiting Frank H. Claypool, at Bowling Green, Ky.

* * *

Pat Ross, of the Ohio Oil Company, with headquarters at Bowling Green, Ky., has been transferred to the Marshall, Ill., headquarters of the company.

* * *

Ralph Stewart, with the Illinois Pipe Line Company, in the Tri-County Field of Ohio-Daviess-Hancock Counties, Kentucky, spent a few days with his family at Casey, Ill.

* * *

W. S. Evans, president of the Lucey Products Corporation, arrived in London recently. Mr. Evans intends to make a visit to several of the continental countries, getting possibly as far east as Rumania.

* * *

F. O. Wright, Oil City, Pa., general superintendent of the National Transit Company, and George Galmis, Butler, Pa., superintendent of the same company, paid a business visit to Pittsburgh, Pa.

* * *

T. Sutter, of the Baker Casing Shoe Company, has been on a business trip through the Mid-Continent and Gulf areas and will return to his headquarters in Los Angeles, Calif., in time for the holidays.

* * *

Cyclone Smith, of the Borden Company, has returned to Chicago after several weeks in Tulsa where he was joined by Harry Williams, general sales manager and A. H. Nooneman, plant manager of the company.

* * *

T. G. Laney, research engineer of the Fisher Governor Company, of Marshalltown, Iowa, spent a few days in Tulsa last week en route to the factory from the Texas fields where he has been conducting a series of experiments.

* * *

Ralph Johnston, of the Sinclair Oil & Gas Company land department, who formerly had charge of leasing in West Texas with headquarters at Abilene, is now in the Tulsa, Okla., office of the company, and is assistant to H. B. Smith, vice president in charge of land and lease work.

* * *

V. E. Baum, for the past eight years district manager of the Yale & Towne Manufacturing Company with offices in Dallas, Tex., is now connected with the Wickwire Spencer Steel Company, Edward C. Bowers, and Charles L. Feldman receivers, in the capacity of engineer and district manager with offices in Tulsa, Okla.

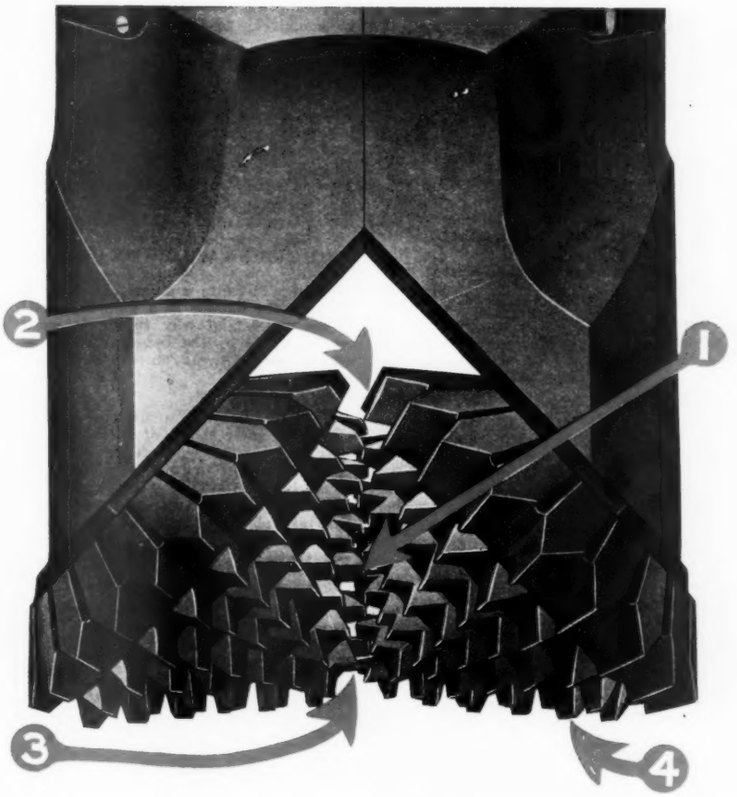
* * *

Martin Moran, president of the Texas Pipe Line Company of Oklahoma, took advantage of his comparative nearness to Findlay, Ohio, when he attended the Institute convention at Chicago, to visit his old stamping grounds. It was his first visit to Findlay in 15 years but he was delighted to find numerous of his old-time friends, many of whom were former members of his old "pitch" club.

* * *

At a meeting of the board of directors of the Marland Oil Company of Texas, at Fort Worth, Tex., the resignation of Vice Presidents M. H. Goode, of Fort Worth, and Alexander Deussen, of Houston, were accepted. Mr. Deussen's plans for the future are unknown. Mr. Goode expects to engage in the oil business as an independent operator and will probably establish offices in the W. T. Waggoner Building in the next few days and maintain a branch office at some centrally located point in West Texas. Mr. Goode has been in charge of the land department of the Marland company at Fort Worth for the past two years; prior to that time he was vice president in charge of the land department of the Marland Oil Company of California with offices in San Francisco. Mr. Goode has been associated with the Marland interests in various capacities for approximately 12 years, the major portion of this time having been spent at company headquarters at Ponca City, Okla.

NOTICE



Bevel on large diameter of cone covered by Hughes Tool Company Patent 1,325,944.

Staggered position of rows of teeth covered by Hughes Tool Company Patent 1,480,014.

Arrangement of teeth to interfit covered by Hughes Tool Company Patent 1,480,014.

Chisel shape teeth covered by Hughes Tool Company Patent 1,647,753.

The Ball bearing type of cone was invented and patented by Howard R. Hughes nearly twenty years ago.

Cones embodying above patented features are being offered for sale thereby infringing patents noted above. Suit is now pending in the Federal Court to prevent infringement and other suits will be instituted, if necessary, and all will be vigorously prosecuted.

HUGHES TOOL COMPANY

Service Plants
Los Angeles, California
Oklahoma City, Okla.

Main Office and Plant
HOUSTON
TEXAS

Export Office
Woolworth Bldg.
New York City, N. Y.

Field Problems and Their Solution

EDITED BY THOMAS F. SMILEY

In order that men connected with the drilling, producing and transporting branches of the petroleum industry may procure quickly a solution of many problems confronting them from time to time in their work, The Oil and Gas Journal has arranged with leading engineers and other recognized authorities to answer questions submitted by readers of this publication pertaining to the work of drilling and producing crude oil and transporting this product.

Everyone is invited to submit questions freely. These questions will be submitted to proper authorities by Mr. Smiley, who edits the page, and answers, based on the best available information, will be published. Each question should give as much detail as possible, especially where it relates to matters where depths of sands, types of sands and operations on adjoining properties would have a bearing on the problem involved. The source of all questions will be considered as confidential and only initials will be published in connection with the question.

In case an immediate answer is important, one will be given by mail if the writer requests it.

In this connection, The Oil and Gas Journal will be glad to publish articles from field men who have devised new methods or practices which are improvements.

DETERMINING SAND POROSITY

Do you know of any reasonably accurate method, one not requiring too much time, for determining the porosity of a sand? I have in mind the adaptability of such a method for field use. Any information or suggestions you might have on the subject would be appreciated.—R. M. W.

A quick method for determining the porosity of a sand has been devised by W. L. Russell of the State Geological Survey, Vermillion, S. Dak. The method is described in detail in the October, 1926, issue of the Bulletin of the American Association of Petroleum Geologists. It is known as the "Acetylene Tetrachloride" method. The author describes it as a quick method for determining porosity in oil and gas sands by means of a reasonably cheap apparatus that can be carried in field work. The novel feature of the method lies not so much in the mechanism as in the use of acetylene tetrachloride, which possesses the advantageous features of readily entering the pore space of all types of sands without causing disintergration and without rapid evaporation.

An idea of the accuracy of this method is given by an analysis of each possible source of error, both in method and apparatus, and the conclusion is reached that the acetylene tetrachloride method affords a reasonably accurate means for the determination of porosity.

A sample of the sand, a piece roughly about one-quarter cubic inch, is in acetylene chloride, the liquid entering the pore space of the sand. As soon as no more bubbles of air are given off, the sample is removed and the liquid adhering to the surface is wiped off. The sample is then placed in the apparatus and its volume obtained by displacement of the liquid in the apparatus. The volume thus obtained is the volume of the sand grains plus the pore space. The sample is then dried and crushed and then placed in the apparatus, the volume of the sand grains thus being obtained. The difference between the two measured volumes represents the porosity of the sand.

Another method, devised by B. E. Lindsey, petroleum engineer, United States Bureau of Mines, Bartlesville, Okla., is also suggested as reasonably accurate and quick method for determining the porosity of a sand. The method in brief consists in placing a sample of the sand to be tested in a bomb of known volume and then subjected to air pressure. Any oil in the sample is removed with carbon tetrachloride and the sample is dried before being placed in the bomb.

The net volume of the sand grains may be obtained by subtraction of the volume thus determined from the volume of the empty bomb. It is assumed that the air will readily enter the pores. In like manner the total volume of the sand sample that is, the sand grains plus the pore space—may be obtained by sealing off or filling the pores, by allowing the sample to remain in molten paraffin for several minutes and then subjecting the sample thus treated to air pressure as described.

In conjunction with the porosity tests, it is suggested that screen tests be made to determine the size of the sand grains. The size, shape and arrangement of the grains are of vital importance in determining the amount of oil that may be recovered from a sand.

PROPORTIONS IN MAKING CEMENT

Directions for making a concrete foundation for an engine say to use the standard mixture. What is the standard mixture?—H. J. F.

The standard mixture referred to is composed of one part cement, two parts sand and four parts crushed stone or gravel. These proportions are expressed thus: 1:2:4. Engineering authorities recommend this combination of ingredients in making reinforced floors, beams and columns, arches, reinforced engine or machine foundations subject to vibrations, and for tanks, sewers, conduits and other water-tight work. The proportions for a rich mixture are 1:1½:3; for medium mixture 1:2½:5, and for lean mixture, 1:3:6.

Portland cement generally is used for reinforced concrete, for mass concrete subjected to stress, and for all concrete laid under water. For coarse work in masses, such as heavy walls, for large foundations supporting a stationary load and for backing for stone masonry, the lean mixture referred to may be used, and cinders, broken stone and broken brick may be used instead of gravel in making the mixture.

BACK PRESSURE ON GAS-LIFT WELLS

I know that the usual practice in gas lift operation is to lower the pressure at the well head as much as possible. I recently heard that some companies are using a flow nipple at the well head and holding some pressure on the well. Have you any information as to the amount of back pressure held on gas lift wells, also what success is being obtained where the method is used?

At least two companies in the Mid-Continent are reported to be using the method you describe and to have met with success in reducing the gas-oil ratio. Some reduction in daily production has resulted, but the decline over a period of time has been more gradual and it is the company's belief that the ultimate production will be greater. The practice is a common one in California, some of the companies having carried pressures on their gas lift wells for a long time. Many engineers are not in favor of using the method as they contend that imposing a back pressure requires a corresponding increase in working pressure. The amount of back pressure held varies from 10 or 15 pounds up to 150 pounds. It is believed by some that the lowest possible pressure at the well head and the lowest working pressure are the best practice. Telescope tubing is being used to accomplish the same result strived for in holding pressure on a well and that is to reduce the velocity at the well head by allowing for a greater expansion of gas. Another reason for holding pressure on a well is to minimize the possibility of casing collapsing, especially in deep wells.

WHY TUBING WEARS ON OUTSIDE

What will cause a string of tubing to wear on the outside in a pumping well? I can understand why tubing is worn on the inside by the rods but can't see why it should wear on the outside.—J. H. K.

There is a certain amount of vertical movement in a string of tubing as the rods are raised and lowered. This movement is thought to be from 1 inch to 2 inches in extent. Thus wherever the tubing comes in contact with the casing wear will take place. Contact with the casing usually occurs at the collars. Hence these will show more wear. In very crooked holes the tubing is more likely to come in contact with the casing than in straight holes. In the crooked hole the wear is likely to show in both the collar and the tubing. Hence wear may take place in places other than at the collars. It is evident then that wear will also take place on the casing, and if the casing is the water string, some of the water problems may be attributed to this cause.

SHALL HE DRILL THREE MORE?

I would be pleased to have you give me the following information. We have sunk three wells here in western Kentucky to a depth of around 500 feet in the Mississippian rocks and have encountered gas in all in the Bethel sandstone, which is about 50 feet thick.

Water stands in these wells about 5 feet from the surface and it bubbles all the time as if it were boiling. If you drop a lighted match into one of these wells every half minute, thus giving the gas time to accumulate above the water, a blaze about 10 feet high will shoot out of the top of the well. This will continue all day if you sit there and toss lighted matches into the hole.

It strikes us that if about six such wells were drilled and all connected together with a small pipe line and the gas were run into some of the small towns only about 5 miles away, in one small gas line, the wells would pay us, as it costs but little to drill them and 10 days will bring in a well.

The dome is large and was recommended by the late Doctor Weller of Chicago as an excellent formation for oil and gas, and we believe that when we reach the Devonian rocks oil will be found. But as we have the gas already, we would like to get something out of it. I decided to write you and see what you thought about six of these wells paying and if it would pay us best to deliver the gas as fuel, make casinghead gas with it or manufacture it into something else.

Should we have the gas tested for pressure? How much pressure should a well have before it will pay to operate and how can we best have this test made? Could we do it ourselves in the field? Should we send a sample of this gas to the person who is to get the pressure?

I have written you at length and possibly have asked some foolish questions, but we are very anxious to get the information. The chief question in our minds is will the gas we can get pay us if we drill more wells. The wells would be likely to have long life, as the structure has large gathering ground.—W.E.L.

You will save time and money if you employ a competent engineer to make a general survey of your property, but the following information will help you in solving your problem:

1. At what rate does the water enter the wells? You may find this out by bailing, swabbing or pumping the water from the wells and then noting the time required for the fluid to build up in the wells again. If the water level cannot be lowered by any of the suggested methods, it is doubtful if the wells can be made commercially productive.

2. If the fluid level can be lowered, what volume of gas will be delivered by the wells? This can be determined by either measuring the volume with a Pitot tube or by installing a meter.

3. What pressure are the wells capable of developing? If the fluid can be bailed down in the wells, shut them in at the well head and install a pressure gauge. This will determine the well pressure.

4. When the wells were drilled into the sand was water encountered immediately on drilling into the top of the sand or did the wells encounter water in the lower part of the sand only? This of course can be determined when drilling into the sand. If water was found at some distance below the top or only in the bottom portion the wells should be drilled into the top only, possibly only a foot or two into the sand.

5. Was any water encountered above the gas sand, and if so was it cased off? If water occurs in a sand or lime above the gas sand it should be cased off.

The Louisville Gas & Electric Co. would probably make an analysis of the gas, as it is equipped to do this kind of work. It is possible for you to take your own samples after the company has instructed you as to the method of sampling.

TEMPERATURE CHANGES IN PIPE LINES

I would like to get some information on the temperature changes in pipe lines, that is, when a pipe line is laid on the ground or when it is buried.—G. W. I.

Temperature tests over a period of one year have been completed at the Bureau of Mines station in Bartlesville, Okla., and it is understood that a report will be issued in a short time. These tests were made at depths of 1, 2, 3 or 4 feet, a continuous temperature having been obtained. Another test by the same organization was completed in 1926. It has been published as a Report of Investigation. It deals with tests on gas lines laid on the surface and buried.

On the uncovered line, the average daily fluctuation during the year was about 65 degrees Fahrenheit. The maximum annual fluctuation was 140 degrees. On the line covered to a depth of 18 inches, the average daily fluctuation was only about 2 degrees Fahrenheit and the annual fluctuation was only 45 degrees. As was pointed out, these results explain the high rates of leakage that often occur from field lines and other lines that are not covered with earth, and show the importance of ditching and burying pipe lines.

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Pipe Line Corrosion Is Big Problem

Efficacy of Protective Coatings Depends Upon Many Factors and Proper Application Is Most Important

By W. H. T. Thornhill*
Wailes Dove-Hermiston Corp.

Corrosion of underground pipe lines is a vital technical and economic problem. It is also well known that the problem of soil corrosion is a very complex one. It is nothing unusual to find sever corrosion in a portion of a joint of pipe, while the rest of it located apparently in the same soil, is still in good condition. The same thing is true frequently with parallel lines laid but a few feet apart.

What the Problem Is

It is logical to first determine what the problem actually is and then work out the solution of it. The problem itself is evident and easily stated. It is simply this: to keep water or moisture away from the pipe surface during its service life—that is all. If this is done, there will be no corrosion, because it is a well-known fact that moisture or other electrolyte must be in contact with the metal to cause corrosion.

The next consideration is: For what length of time is it desired to keep the moisture away from the pipe? If a temporary line in good soil conditions is under consideration, the conditions to be met by the protective coating will be different than if the line is a permanent one in bad soil.

In considering the problem of choosing a protective coating, good judgment, as well as economic reasons and practical considerations in the field, would indicate the choice of a material that would satisfactorily take care of the worst conditions. Then the more favorable conditions are also taken care of, and an expensive reconditioning job may be avoided. Some times conditions at certain places along the right of way are obviously so favorable that it is possible to use a cheaper material than for the rest of the line. In general, however, it would be much safer to adopt a material for the whole line, which will take care of the worst possible conditions that can be anticipated.

Requirements for Permanent Installations

The requirements for a permanent coating are:

1. It must be waterproof.
2. It must be unaffected by soil acids and alkalies.
3. It must have good adhesion to the pipe surface and maintain its adhesion.
4. It must not disintegrate with age, due to internal changes of a chemical nature.
5. It must be incapable of absorption by the soil in contact with it.
6. It must not be affected by underground temperature changes.
7. It must be a dialectric, in order to offer protection against electrolysis.
8. It must be capable of practical application in the field and at a speed that will not retard the progress of the work.
9. It must be unaffected by ordinary handling in the field after application and not damaged by lowering pipe into the ditch.
10. It must be of substantial thickness.
11. It must be economical, that is, the cost of using it must be such as to more than justify its use.
12. It must have been in actual use long enough to show actual long time records of satisfactory performance on pipe underground.

Failure of a coating to fulfill any one of the first seven requirements marks the end of its usefulness as a protective medium. The length of time it will continue to meet all of these seven requirements, after application, determines whether it is suitable for temporary or permanent protection. As permanent installations are the main problem, it is advisable to discuss the various factors principally from this angle.

*Before American Petroleum Institute, Chicago.

Reasons for Requirements

The requirement that the protective coating must be waterproof is obvious, when it is realized that the solution of the entire problem is to exclude water, moisture, or other electrolyte, from the pipe surface, and to continue to exclude it throughout the service life of the pipe. As a consequence, the protective coating must not only be waterproof when it is first applied, but must continue to be waterproof, years after installation underground. Many so-called protective compositions, especially paint applied cold, fail for this reason. A good many coal tar paints contain water, not from design, but because no effort is made to eliminate it. Other compositions are manufactured with water acting as a vehicle. It would seem poor practice to put a material containing water on a pipe line, if one of the primary objects in making such an application was for the purpose of excluding water.

If soil acids and alkalies affect the coating, if it loses adhesion and comes off the pipe surface, or if it disintegrates due to internal chemical changes, there is no advantage in using it for protective purposes of a permanent nature. Moreover, such coatings are a positive disadvantage, because they lose their protective value in spots and corrosion is concentrated. Extensive pitting would result. A pipe line without any protective coating would probably last longer than one thus inadequately protected, because corrosion would be distributed and not concentrated.

There is usually more or less movement of pipe lines underground. Good adhesion of the coating to the pipe surface is therefore absolutely essential, otherwise the coating will be torn loose from the pipe and trouble will result. Many thick coatings have failed due to this cause.

It is also obvious that the coating must not be susceptible to absorption by the oil in contact with it. In this respect, some coatings are affected by a considerable extent by some types of soil. If this occurs, there is naturally no advantage in using such a material for permanent work. In general a soft coating is much more susceptible to absorption than a hard one.

In most climates a considerable variation in ground temperature occurs between winter and summer. The variation in the temperature of the buried pipe line is accordingly dependent on ground temperature, as well as depth and size of pipe, and the velocity, character and temperature of the oil flowing through it. A protective coating must, therefore, possess a temperature range between the brittle and softening points, somewhat greater than the variation to be expected in the pipe. Otherwise the coating will either crack at the low temperature, or become soft enough at the high temperature to sag and flow off. If either condition occurs, the coating has largely lost its usefulness as a protective medium. If the oil is of such a character as to require considerable heating, for example up to 140 degrees Fahrenheit the temperature range possessed by the coating is of even greater importance, on account of the extreme variation. In such a case the variation may be as much as 100 degrees Fahrenheit. Great care should be exercised to make sure that a protective medium under consideration possesses a temperature range considerably greater than the expected temperature range of the pipe.

Oil pipe lines are seldom affected by electrolysis due to stray electric current. However, in other industries such as gas or water distributing systems in cities, this is a serious problem. Consequently in such cases one of the requirements of a good coating for permanent use is that it must be dialectric to conform to this condition.

In laying a pipe line speed is often the most important consideration. Any element entering into the construction, which is likely to retard the work without definite advantage, is a detriment. A good protective coating must be capable of application as fast as the other features of the work progress. Weather or field conditions, over which there is no control, enter into the speed of application.

Rough Handling

Pipe line construction is rather rough work due to topographical conditions and transportation difficulties. The same carefulness usually exercised in other construction work, at a fixed location, is more difficult to realize in pipe line construction on account of the shifting location. The pipe coating after application, must, therefore, be capable of withstanding rough handling without serious injury. If it requires extreme care in handling, it is hardly practicable. In recent years better tools and more careful methods for handling the pipe have been developed. With the best of care, however, there will likely be some damage to the coating. It, therefore, also must be capable of being easily and quickly repaired. The harder coatings without brittleness but with the best adhesion fulfill handling requirements better than the softer coatings. Atmospheric temperatures during the time the line lies aboveground must be taken into consideration. If the work is done in very hot weather, the pipe itself may have a temperature of around 140 degrees Fahrenheit and the coatings must not be affected to the extent that it will sag or run off. If, on the other hand, the work is done in cold weather, the coating must not crack either before or during the time the pipe is lowered into the ditch.

It has been established by laboratory tests and proved by experience, that a permanent coating to be effective must have substantial thickness. A coating may possess all the desirable requirements previously mentioned, but if it cannot be applied so that a thickness of at least one-thirty-second of an inch will be obtained, the protection will not be permanent. Physical thickness is absolutely essential for permanency. For this reason paints applied cold, which usually have a filk thickness of from .005 to .01 of an inch per coat, cannot be con-

(Continued on Page 98)

STEEL AT HIGH TEMPERATURES; STRENGTH AND SAFETY FACTORS

By T. McLean Jasper*
Director of Research, A. O. Smith, Corp., Milwaukee, Wis.

In a discussion of the question involving safety in design and the strength of metal in service under elevated temperature conditions the matter must of necessity be considered from two different angles. The one deals with the nature of the distribution of stresses in a particular design and considers a constructive change of inadequate safety measures and the other considers the careful production of facts concerning the strength of the metal at elevated temperatures which is used in the equipment which has been designed.

In other words, a poorly-designed structure using very strong metal may not be as safe as a well-balanced design using a weaker metal, and unless the strength values of the steel under appropriate testing conditions are obtained the factor of safety when assuming a given stress is not what it is supposed to be.

The question of producing the safest structures therefore, considers the best balanced design coupled with the best metal available for the business in hand when viewed from the soundest engineering standpoint.

In the matter of design is also involved the question of the fabrication methods adopted in joining metal together to produce a finished structure. If the methods of fabrication can be relied upon to produce 100 per cent strength and security without thickening the metal in the neighborhood of the joints the design becomes much more simple than would otherwise be the case.

Factors of Safety

The real factor of safety in a structure is obtained by dividing the actual load that can be carried by it by the actual load imposed upon it for service conditions. This is a very difficult task to perform because if the actual load that a structure can carry is found there is no structure left in most cases to perform the essential function of carrying a future imposed working load.

*Before American Petroleum Institute, Chicago.

For this reason the application of safety in pressure containers are made on test results considering the maximum stress conditions in the container coupled with appropriate test results on the metal of which they are composed. In the engineering profession the term "Factor of Safety" has been applied promiscuously. We have factors of safety on the ultimate strength, factors of safety based on the yield point and several other methods of using this particular term.

The author believes that the factor of safety based on the ultimate or fracture strength of a material or structure under conditions appropriate to the manner in which it is to be used is the most satisfactory method of applying it.

The reasons for this are as follows: The fracture strength of a piece of metal is the easiest experimental value to determine accurately and, moreover, when using this quantity and dividing by the maximum stress imposed upon a structure the degree of safety is as shown by the ratio obtained.

Calculating Factors

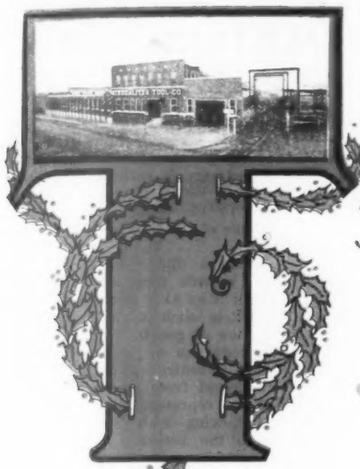
Factors of safety have often been calculated on pressure containers to be used at elevated temperatures by applying the short-time laboratory test for strength of the metal together with the ordinary cylinder formula

$$S = \frac{PD}{2t}$$

without considering the weakening effect due to lack of reinforcing at openings or the weakening effect due to the shape of the heads or sometimes the weakening effect of the joint if it is not equal in strength to the metal which is joined.

If a pressure container is joined to-

(Continued on Page 153)



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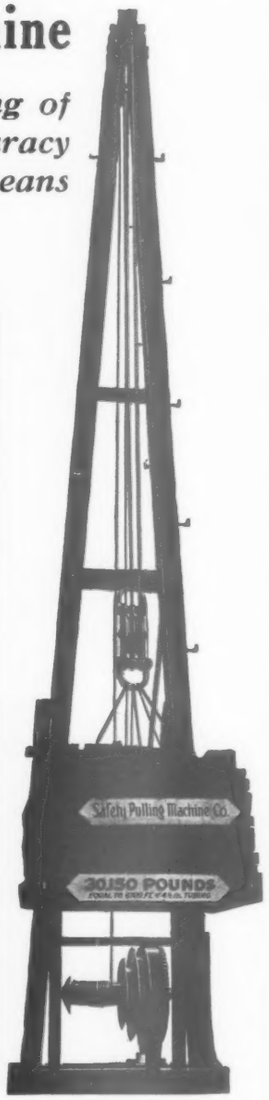

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DEVELOPMENT AND PRODUCTION ENGINEER'S PLACE IN OIL INDUSTRY

By A. C. Rubel*
Petroleum Engineer, Union Oil Co. of California.

The petroleum engineer is not, as many oil men seem to believe, a scientific expert imported from some place without the industry to criticise, by means of slide rule manipulations and unintelligible language, the established order of things, but rather he is the logical result of a progressive development within the industry itself to produce an individual fitted by experience, training and education to handle those particular problems which involve the application of engineering methods to the development and production of petroleum.

Mechanical, electrical, and metallurgical engineers have long functioned successfully within their respective industries. A petroleum engineer is essentially a translator to the operating and executive members of the industry, capable of assembling technical and scientific principles into practical, workable form for the help and guidance of executives and field operators, and of analyzing field problems into technical form for scrutiny and solution.

Being a relatively new development, we are, in many cases, traveling uncharted courses with no precedent to guide us, so that progress is necessarily slow, blind courses are frequent and mistakes are many.

Effective Employment

Prior to the Ponca City meeting of your conservation committee, the statement was made to me by a successful operator that 20 years ago, we knew nothing and cared less about conservation; if there was too much gas, it was blown in the air and nobody worried. "Now," he said, "since you damned engineers have broken into the business, we are in a hell of a fix all of the time." If there is an element of truth in the arraingement, it is not because progress is undesirable but because the tools of progress are not skillfully handled and applied.

The most effective employment of a petroleum engineer and the manner in which he may best serve the industry is by the closest co-operation with the executives and field operators, serving as a contact, a correlator between the scientific problems, which they must meet, and the principles and progress of related arts and sciences which may assist them in their solution.

Many of our greatest advances have been the result of the application of knowledge and experience gained from sources without the industry. The metallurgist and mechanical engineer have made present drilling methods possible by the development, in co-operation with the field operations, of metals and machinery. The chemist has compounded cement, which will meet the most severe conditions of oil field practice, and there can scarcely be named an art or science which has not been freely drawn on for the betterment of our own conditions.

Contact with Field

The petroleum engineer must be in close touch with the developments and advances in his own and contemporaneous branches of his profession, and above all, he must have direct knowledge and contact with field operations that he may not be led astray by his own imagination and enthusiasm. It is only by the proper combination of engineering and technical training, experience, imagination and sound economics coupled with hard-headed practical operating knowledge, that the best results may be accomplished.

An engineer's stock in trade is records, and the effectiveness of his efforts can only be in direct proportion to the completeness and accuracy of the information available. Complete systematic and accurate recording of operations, of whatever nature, is at once the most important and in far too many cases, the least applied of any oil field practice, and because of the lack of records and the absence of essential information, the industry is suffering, and must continue to suffer the loss of incalculable sums by not being able to take full advantage of the application of newer practices.

Through the systematic analysis of such records have come practically all of our recent advances in producing technique such as a realization of the function of gas in the production of oil, a recognition of the necessity for back pressure control, and the advantages to be derived from the employment of gas lift and repressuring.

Following records in importance, comes the necessity for intelligent and recorded experimentation to test and confirm conclusions drawn.

The manner in which a hole or an entire field is drilled generally has a more important bearing on the productivity than the manner in which it is actually produced. This is particularly true in the development of the deeper rotary drilled fields. How many wells drilled in productive territory have been partially or completely ruined by improper handling of mud? How many pumpers are economically a loss due to excessively crooked holes? How many pools have been ruined, or their productivity greatly impaired by flooding due to inadequate casing operations?

Production Methods

For a time the best talent and skill in the industry was concentrated on getting a hole down rapidly, and cheaply, without giving thought to what would follow, once it was turned over to "production." There have been very few, pitifully few, improvements in production methods prior to the past three years.

The petroleum engineer recognizes this relationship, and one of his most important problems is to correlate the two operations. He is chiefly concerned from the development standpoint in such practices as exclusion of water; protection of production, casing and cement, proper spacing and penetration of wells, proper combination of casing sizes to reach certain sands and protect others, cementing operations, shooting, coring, necessary off-setting to protect the companies' interest, correlation of data on his own and adjacent leases, systematic preparation and supervision of records and a multitude of other details which the busy executive and field superintendent is only too glad to place in capable hands.

The use of electricity is in its infancy; development of high-speed equipment for hard rock drilling is an important field of research; the application of automatic drilling machinery offers many possibilities; development and improvement of cementing operations contain much unexplored territory; mining for oils is a comparatively recent conception.

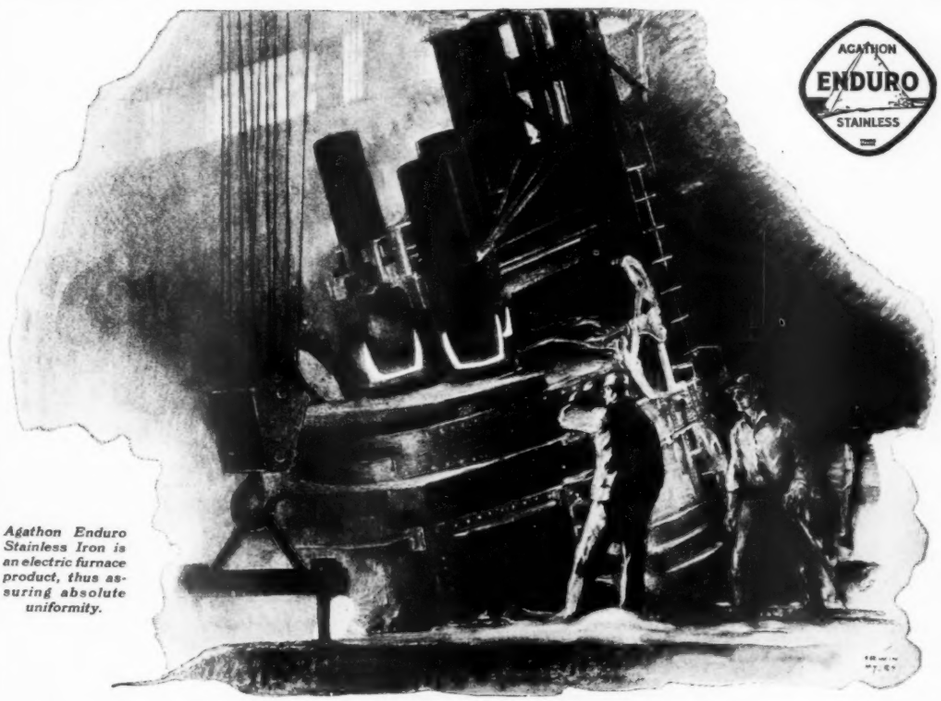
The field of production offers perhaps the greatest opportunity for development. It is in this field that strides are being made which have shaken the industry to its very foundation, and have influenced the industrial and economic conceptions of the nation as a whole.

Economic Efforts

Unfortunately, the average petroleum engineer, in common with the industry as a whole, understands but little, and too often cares less about the economic effects of developments. The introduction of gas lift furnished the Seminole operators with a wonderfully effective tool, but because it was not properly understood and intelligently applied, the markets were glutted with cheap oil, and the loss to the industry has been great. Who knows but that perhaps there are other Seminoles just around the corner?

The use of repressuring has proven successful in many small semidepleted

*Before American Petroleum Institute, Chicago.



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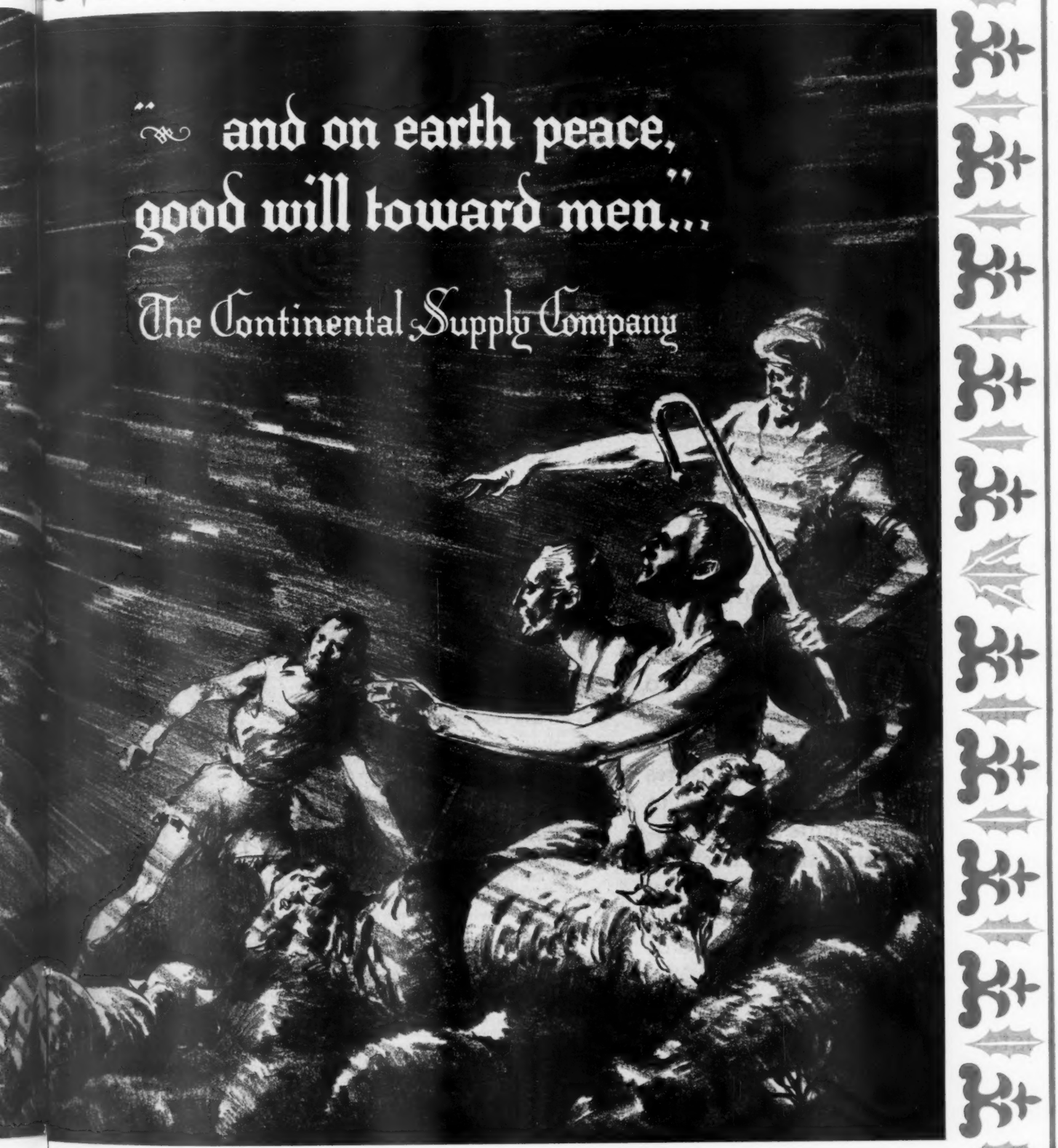
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good will toward men..."
The Continental Supply Company

areas where results, though high in percentage recovery, have been relatively small in actual barrels, and have had no appreciable effect on the general situation. Repressuring is now being applied on a commercial scale to flush production with every indication that it will meet with proportionate success. What would be the economic effect if we could increase the yield of a field to double, or treble its present expected natural production? What would be the effect if the 300 odd million barrels which the Signal Hill Field has already produced could be increased to 600,000,000 or 900,000,000 bbls., and done cheaply and economically from the operating standpoint? What would be the effect of doubling Seminole, or of maintaining it at its present rate of production for a year, or perhaps more? And even more important, what would be the effect if such production could be controlled and regulated to meet the existing market conditions? Such results are not beyond the realms of possibility, and in fact could be partially realized today should legal and operating conditions permit. We stand on the threshold of a new era in petroleum development and production, and petroleum engineering methods clearly and unmistakably point the way.

With the help and co-operation of the industry as a whole, we, as engineers, can place at your disposal as operators the tools to accomplish the very results I have indicated. The employment of these tools intelligently and to the best economic advantage is primarily an executive problem, but there must at all times be the closest co-operation and understanding between the designers and users, the engineers and the operators. This co-operation we have not always had, due principally perhaps to the lack of a common meeting ground, and the absence of mutual understanding.

Repressuring to be of maximum benefit requires practically unified control of a given pool. To apply it successfully these must be worked out on a new legal conception of ownership and operation without which the work of the engineer comes to naught.

Intelligent Analysis

For intelligent analysis of operations we must have accurate and detailed costs. Few companies have accounting systems capable of engineering analysis.

Slight changes in producing practices such as methods of lifting and handling oil, storage, etc., may vitally affect refinery and absorption plant operations. We have little opportunity to know of their need and difficulties.

In short with the present trend of highly organized development within the various branches of the industry, and their very close interrelation there must be some means, some medium for the interchange of opinions and operating needs in order to avoid serious conflict. The proposed section of the Institute should help to accomplish this purpose. Had such a medium been in existence, and had the possibilities of gas lift and its results been carefully considered from the point of view of the industry as a whole, could not perhaps the Seminole debacle have been partially foreseen and perhaps avoided or at least somewhat controlled?

Mr. Marland, as chairman of your committee on conservation, called upon us for assistance. We found we were seriously handicapped at the very start, first by the almost total lack of uniformity of development and production records throughout the industry and secondly by an almost abysmal lack of specific and definite information on some of the very fundamental principles of our every-day practices.

Oil Field Records

We found that we knew but very little, for example, of the laws governing the flow of oil-gas mixtures through tubing and yet such information is fundamental to intelligent gas lift design. Our information was very meager on such problems as the effects of dissolved gases on physical properties of oil, or the mechanics of fluid movement through sands, and yet these are fundamental.

The Institute might render a service by standardizing oil field records, so that comprehensive analysis might be made over the entire industry to develop facts and principles necessary to our every day practice, might it not standardize or at least correlate research to the end of eliminating endless duplication.

NOVEMBER OPERATIONS OF EASTERN FIELDS

Summary of Wells Completed

Field—	Comp.	Prod.	Dry	Gas
Allegany	41	63	0	0
Bradford	115	291	0	0
Middle Field	6	26	0	0
Venango-Clarion	23	17	1	7
Butler-Armstrong	12	3	4	4
Southwest Pennsylvania	27	49	4	18
West Virginia	81	268	22	36
Southeast Ohio	82	927	25	21
Total Nov.	387	1,644	56	86
Total Oct.	358	1,350	34	65
Difference	29	294	22	21

Summary of Work Under Way

Field—	Rgs	Drg.	Tti
Allegany	10	32	42
Bradford	16	69	85
Middle Field	0	5	5
Venango-Clarion	2	19	21
Butler-Armstrong	5	9	14
Southwest Pennsylvania	7	26	33
West Virginia	34	136	170
Southeast Ohio	20	84	104
Total Nov. 30	94	380	474
Total Oct. 31	115	373	488
Difference	21	7	14

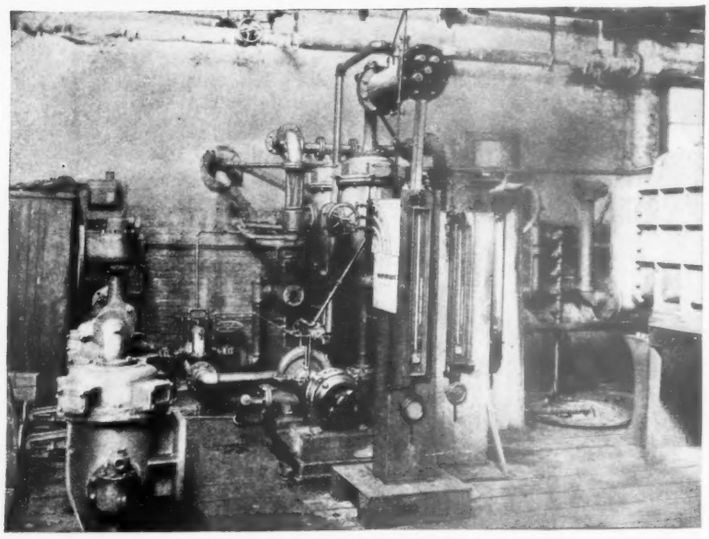
WELLS COMPLETED
ALLEGANY FIELD

July 2 fee, Forest Oil Corp. 314 1
July 2 fee, Forest Oil Corp. 321 1
July 2 fee, Forest Oil Corp. 301 1
July 2 fee, Forest Oil Corp. 33 1
Tract 1, Hazelwood Oil Co. 68 1
Tract 1, Hazelwood Oil Co. 08 ..... pressure
Boyd & Jordan, L. E. Jordan 5 1
Boyd & Jordan, L. E. Jordan 5 1
Fee, H. W. Breckenridge and Empire, Ltd. 1
Fee, Phillips & Howard 2
Fee, Albert Oil 3
Fee, Empire, Let., et al 1
G. P. Reid, agent, C. O. & W. O. Taylor. 4
Fee, Robert J. Dermitt 1
Fee, Cuba Natl. Bank 25 1
Fee, Root & Perry 1
Fee, E. G. Williams e. al 2
Fee, LeSuer Oil Corp. 2
Fee, LeSuer Oil Corp. 2
McDermott, John K. Cochran et al 2
McDermott, John K. Cochran et al 2
Fee, McDivitt et al 4
Fee, McDivitt et al 4
Fee, A-C-A Oil Corp. 1
Fee, W. J. Hughes et al 2
South Penn et al, First Trust Co. Wva. 94
L. H. Weatherby, Robert J. McDermitt. 1
Hubert Cass, W. B. Davidson et al..... 1
Fee, Kinley Producers 1
Fee, C. M. & F. J. Lippert 1
Kinley Oil, Pure Penn Oil 1
Kinley Oil, Staley & Luke 2
Chipmonk land, South Penn Oil 1
Chipmonk land, South Penn Oil 1
Harbel & Meridan, N. V. V. Franchot.... 1
Fee, Miller & Bovaird 1
McCaffery & Westran, Mrs. H. S. Westran 1
Baker, M. Shear 2
Fee, L. V. Forness et al 1
Fee, John C. Minderler 1
Kinley Oil, Pure Penn Oil 1

Wells completed 41
Production 63
Pressure 1

BRADFORD FIELD

Tyler fee, Forest Oil Corp. 208 1
Tyler fee, Forest Oil Corp. 79 1
S.ms fee, Forest Pet. Corp. 1-A-42 1
Niles fee, Forest Pe.. Corp. J-02....pressure
Niles fee, Forest Pet. Corp. 1-J-2 1
Niles fee, Forest Pet. Corp. 154 1
Niles fee, Forest Pet. Corp. 57 1
Pratt Hollow, 3-d-1, Petroleum Reclamation Co. 1
Mary C. & S. H. Elder, S. H. Elder et al. 1
Bing, 392, Hooper & Elder 1
Bing, 389, D. W. Daly 1
Bing, 428, J. A. Hooper 1
Bing, 368, Wilson & Fitzgibbon.....wtr
M. E. Jones, S. P. O. 242 1
Dent, S. P. O. 116 1
Melvin, S. P. O. 023 ..... pressure
Hamlin, S. P. O. 108 1
Midland Keating, S. P. O. 46 1
Hooker, S. P. O. 26 1
Kendall, S. P. O. 69 1
Midland Keating, S. P. O. 45 1
Blair, S. P. O. 60 1
Melvin, S. P. O. 207 1
Melvin, S. P. O. 208 1
Brooks, S. P. O. 02 ..... pressure
Newell, S. P. O. 08 ..... pressure
M. E. Jones, S. P. O. 241 1
M. E. Jones, S. P. O. 240 1
Hooker, S. P. O. 25 1
Davis, S. P. O. 33 1
Melvin, S. P. O. 024 ..... pressure
Bing, 88, S. P. O. 16 1
H. E. Smith, S. P. O. 151 1
H. E. Smith, S. P. O. 09 ..... pressure
Bing, 408, S. P. O. 17 1
Lots 5 and 6, S. P. O. 06 ..... pressure
Culbertson lots, S. P. O. 67 2
D. M. Cotton, S. P. O. 09 ..... pressure
Moody, S. P. O. 87 ..... pressure
Bing, 439, S. P. O. 104 1
Ding, Satt., S. P. O. 128 1
D. M. Cotton, S. P. O. 64 1
D. M. Cotton, S. P. O. 65 1
Lots 5 and 6, S. P. O. 05 ..... pressure
Tract 1, Hazelwood Oil 72 1
Tract 22, Hazelwood Oil 44 1
Tract 23, Hazelwood Oil 104 1
Fee, South Penn Oil 1
Fee, South Penn Oil 1
H. H. Redfield et al, South Penn Oil ... 2
Fee, F. Daly 1
Fee, W. T. Piper et al 2
South Penn Oil, E. F. Curtis et al 1
Fee, Hazelwood Oil 1
N. V. V. Franchot, W. C. Kennedy Co.... 1
South Penn Oil, John Jackson, Jr. 1
Fee, J. A. Walters estate 2



Vacuum Pump *for Oil Refinery* on Test

THE photograph shows a Wheeler Three-stage Vacuum Pump for a large oil refinery, set up for tests in the Wheeler laboratory. All Wheeler Vacuum Pumps are tested for capacity at the specified vacuum before shipment. Customer's representatives are invited to witness these tests.

The simple construction of the steam jet vacuum pump insures maintenance of test capacities in the field. Adjustments are unnecessary (in fact impossible) after the steam jet leaves the shop. Economy is maintained throughout the life of the machine without the need of attention or repairs.

For further information, write

Foster Wheeler Corporation.

165 Broadway, New York, N. Y.

A Consolidation of

Power Specialty Co. and Wheeler Condenser & Engineering Co.

Branches in Principal Cities

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FOSTER WHEELER

FRACTIONATING TOWERS HEAT EXCHANGERS
STEAM JET AIR PUMPS SUPERHEATERS
TUBE STILLS VACUUM PUMPS
WATER COOLED FURNACE SURFACES
BRASS AND COPPER TUBING AND PIPE

AERO UNIT COAL PULVERIZERS
AIR HEATERS CENTRIFUGAL PUMPS
CONDENSERS COOLING TOWERS
ECONOMIZERS EVAPORATORS
EXPANSION JOINTS FEED WATER HEATERS

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A Complete Line of Better Oil Well Equipment

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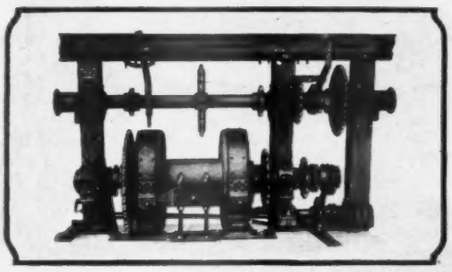
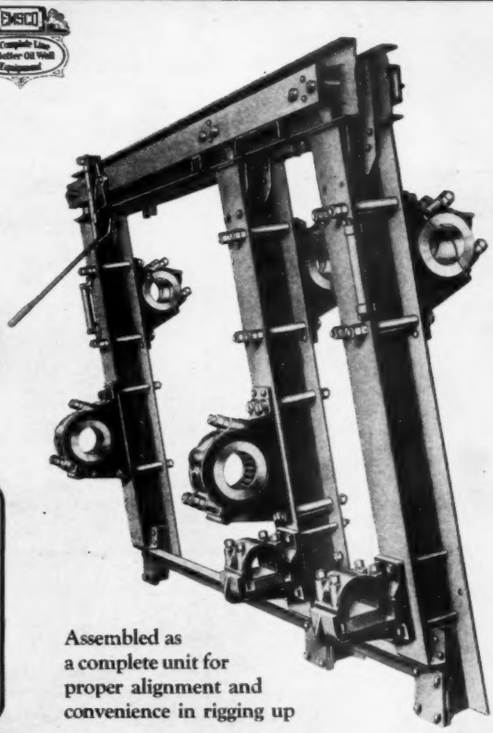




Assembled as a complete unit for proper alignment and convenience in rigging up

Emsco Type "RR" Anti-Friction Roller Bearing Draw Works

Another Emsco Master Achievement Embodying the Finest and Best Principles of Rotary Draw Works Design and Construction in Strict Accordance With Service Requirements

ANTI-FRICTION ROLLER BEARINGS. The drum shaft of the Emsco Type "RR" Draw Works rotates on extra large heavy-duty Hyatt roller bearings, lubricated by the Alemite system. The bearings are mounted in heavy steel self-aligning boxes.

DRUM SHAFT. The 8-inch diameter drum shaft is made from an S. A. E. 3135 Chrome Nickel Steel Forging. The hardened races for the roller bearings are pressed onto the shaft and it is not necessary to remove them when changing clutches or sprockets.

STEEL POSTS. The 10-inch x 10-inch H-Beams are reinforced above and below the bearings with plates welded and riveted into place. Reinforcing spacers are provided at the bolt holes between the flanges of the posts.

LINE SHAFT CLUTCH SHIFTING MECHANISM. The line shaft clutch shifter lever and bracket are mounted on a channel member which is independent of and secured to the head board on the front side of the draw works. This channel member is provided with brackets for receiving the chain guards. A similar channel is provided at the opposite side of the head board, to which the rear chain guard brackets are attached. These two channels are tied together by means of the three pairs of bolts, each pair passing through the upper portion of the steel posts. A heavy angle section ties the posts together at the bottom, just beneath the shoulders which rest upon the derrick sill. This feature insures the proper spacing of the posts and is a great help in rigging up. The distance from center to center between Post No. 1 and Post No. 2 is 94⅝ inches. The distance from center to center between Post No. 2 and Post No. 3 is 39½ inches.

LINE SHAFT. The line shaft runs in heavy steel boxes, lined with high-grade babbitt. It is 6½ inches in diameter and made of an S. A. E. 3135 Chrome Nickel Steel Forging.

NON-BURSTING DRUM ASSEMBLY. Emsco's well-known patented Press Forged Steel Brake Wheel and Drum Assembly is used exclusively on all Emsco Draw Works. The brake rims are 46 inches in diameter with a 9½ inch face. In the Emsco construction these pressed steel forgings are secured between two flanges, placing the machined rivets in double shear.

SOLID WOVEN BRAKE LINING. Emsco brake bands are lined with Emsco Solid Woven Brake Blocks. An air gap is provided between each block, which helps to cool the brake. This sectional lining provides a more flexible band assembly and helps to give greater contact over the face of the brake wheel.

BRAKE EQUALIZER. The brake equalizer is positive, and embodies a safety measure to permit the use of one band should the other become inoperative. The brake lever is secured to a steel plate which acts as a template when lining up and bolting the braking mechanism to the derrick floor.

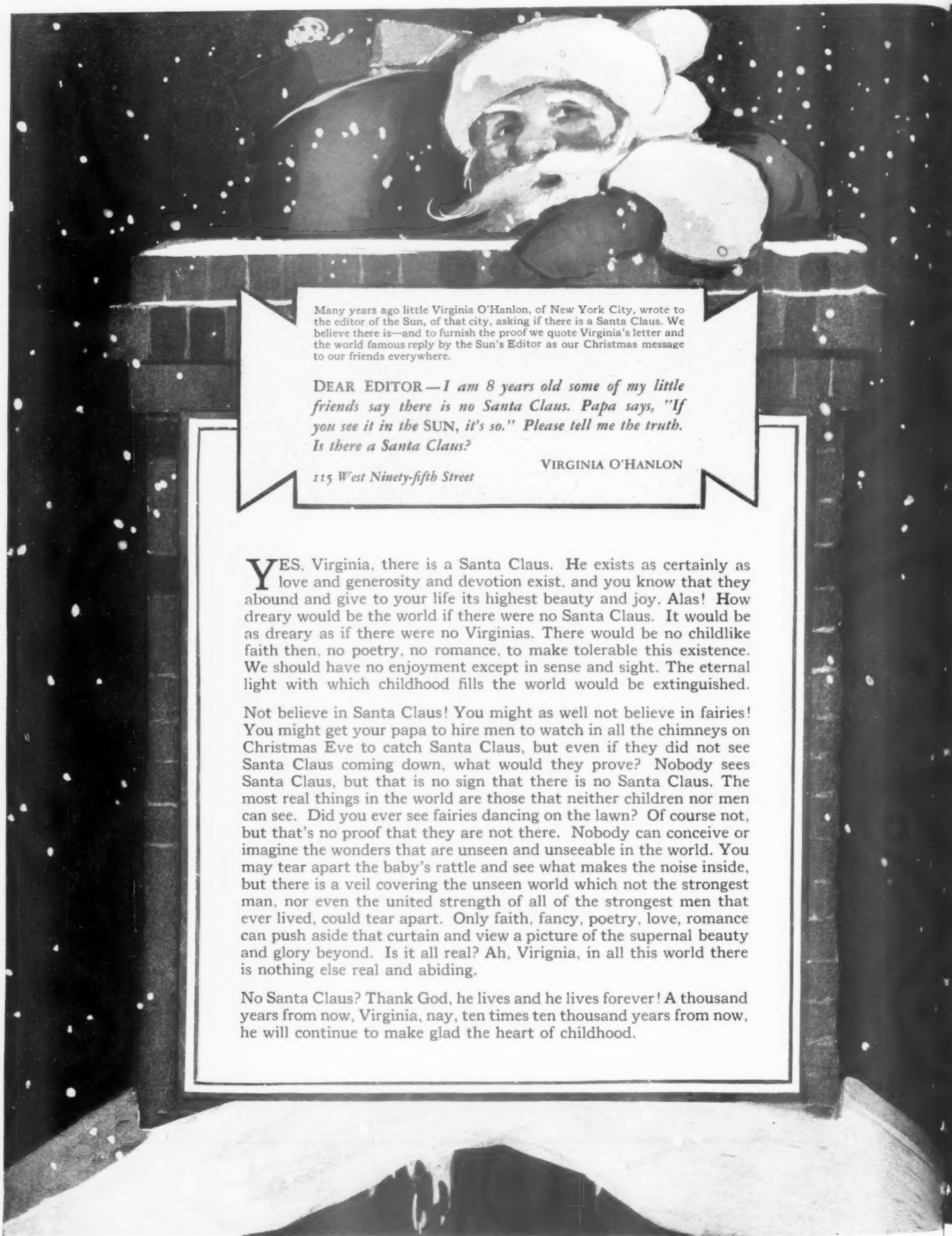
ROTARY DRIVE CLOSE TO DERRICK FLOOR. The chain drive to rotary machine runs from the countershaft between the second and third posts close to the derrick floor. This drive, when covered with the chain guard, does not exceed two feet in height, and presents much less obstruction to the movements of the derrick crew than the old type of drive from line shaft to rotary machine. The double countershaft sprocket rotates on large roller bearings, lubricated by the Alemite system.

CLUTCH SHIFTING MECHANISM. Drum shaft clutches are all controlled by foot pedals mounted on floor, in position convenient to driller. Knee operated low speed clutch furnished if desired.

SPROCKETS. Steel sprockets and clutches, and manganese cat heads are standard. Manganese equipment can be furnished at an additional charge if desired. To insure absolute uniformity of product, the steels used in the construction of the Emsco Draw Works are obtained from the largest and most reputable steel manufacturers in the United States.

EMSCO
Derrick & Equipment Company
Los Angeles Houston California Texas
New York Office 150 Broadway
Factory Branch at Tulsa

EMSCO STEEL EQUIPPED WELLS ARE SAFE



Many years ago little Virginia O'Hanlon, of New York City, wrote to the editor of the Sun, of that city, asking if there is a Santa Claus. We believe there is—and to furnish the proof we quote Virginia's letter and the world famous reply by the Sun's Editor as our Christmas message to our friends everywhere.

DEAR EDITOR—*I am 8 years old some of my little friends say there is no Santa Claus. Papa says, "If you see it in the* SUN, *it's so." Please tell me the truth. Is there a Santa Claus?*

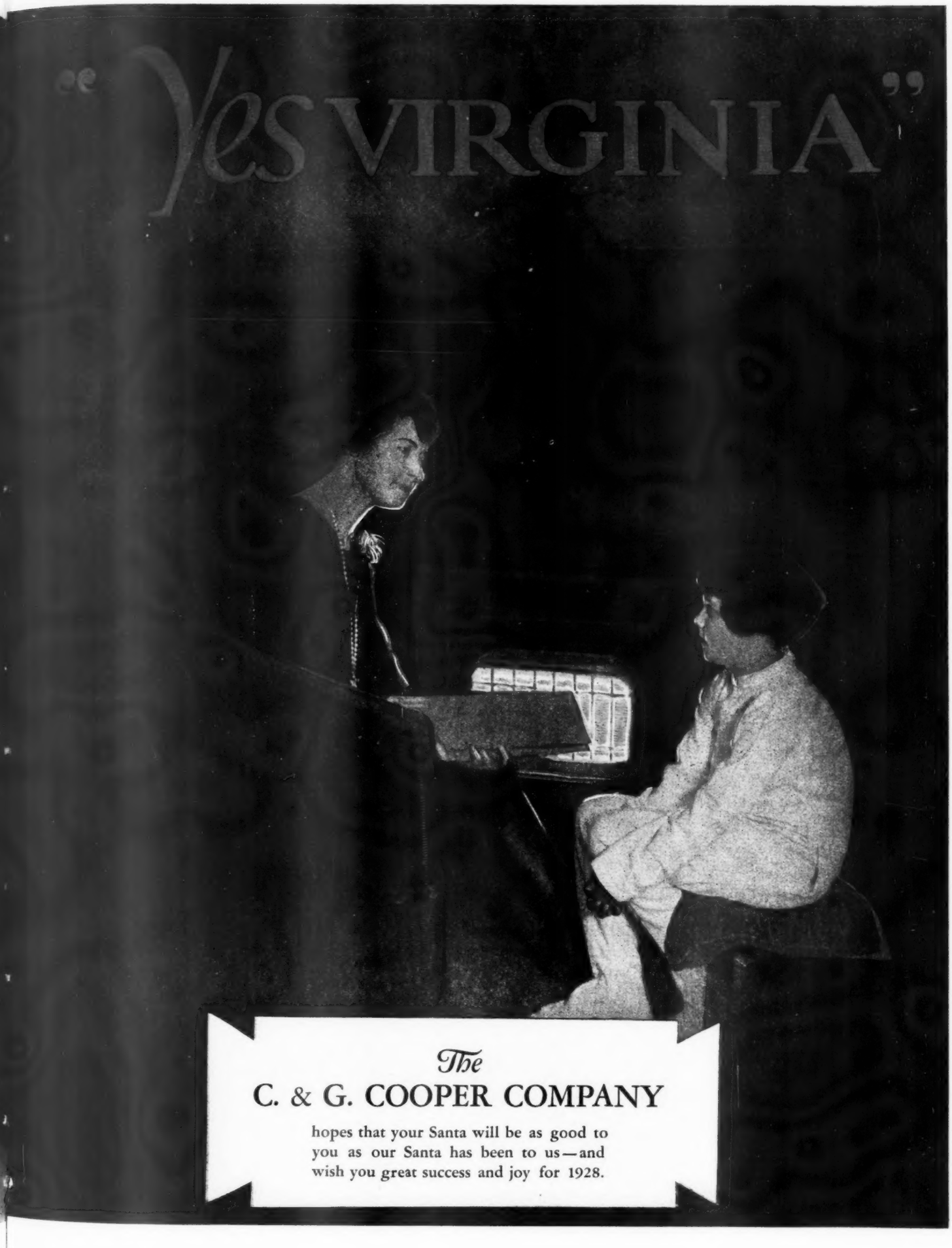
VIRGINIA O'HANLON

115 West Ninety-fifth Street

YES, Virginia, there is a Santa Claus. He exists as certainly as love and generosity and devotion exist, and you know that they abound and give to your life its highest beauty and joy. Alas! How dreary would be the world if there were no Santa Claus. It would be as dreary as if there were no Virginias. There would be no childlike faith then, no poetry, no romance, to make tolerable this existence. We should have no enjoyment except in sense and sight. The eternal light with which childhood fills the world would be extinguished.

Not believe in Santa Claus! You might as well not believe in fairies! You might get your papa to hire men to watch in all the chimneys on Christmas Eve to catch Santa Claus, but even if they did not see Santa Claus coming down, what would they prove? Nobody sees Santa Claus, but that is no sign that there is no Santa Claus. The most real things in the world are those that neither children nor men can see. Did you ever see fairies dancing on the lawn? Of course not, but that's no proof that they are not there. Nobody can conceive or imagine the wonders that are unseen and unseeable in the world. You may tear apart the baby's rattle and see what makes the noise inside, but there is a veil covering the unseen world which not the strongest man, nor even the united strength of all of the strongest men that ever lived, could tear apart. Only faith, fancy, poetry, love, romance can push aside that curtain and view a picture of the supernal beauty and glory beyond. Is it all real? Ah, Virginia, in all this world there is nothing else real and abiding.

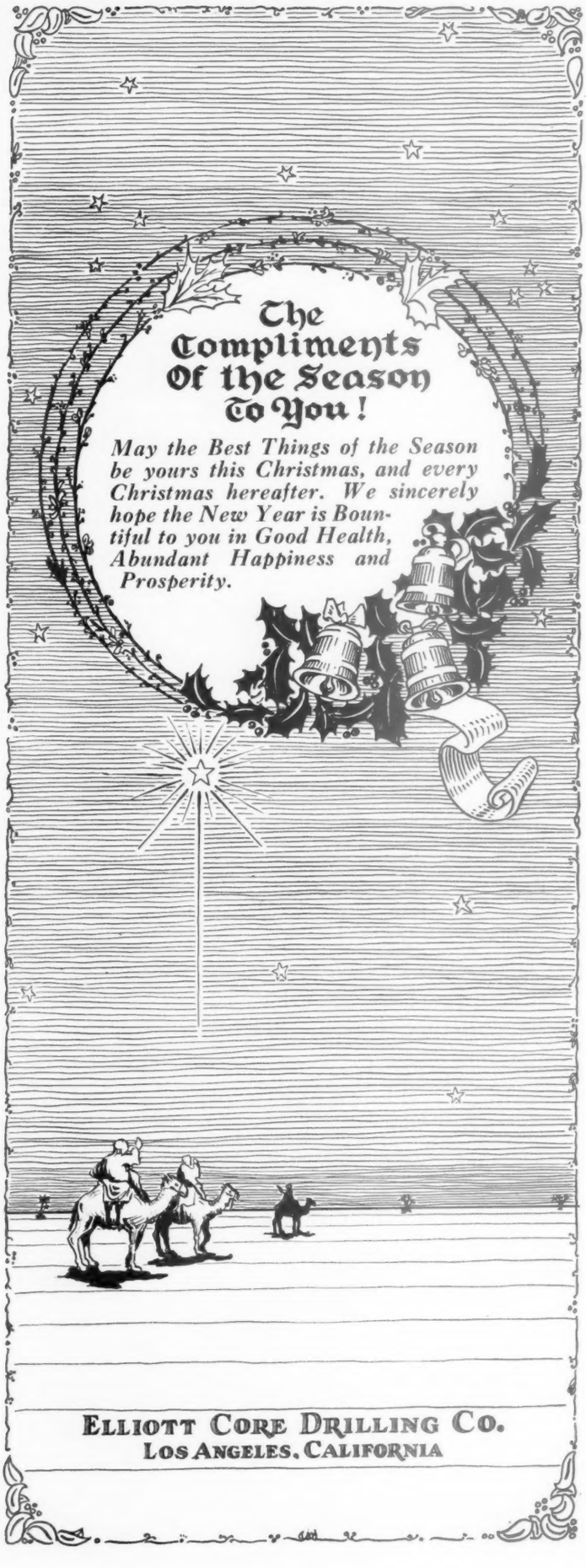
No Santa Claus? Thank God, he lives and he lives forever! A thousand years from now, Virginia, nay, ten times ten thousand years from now, he will continue to make glad the heart of childhood.



The

C. & G. COOPER COMPANY

hopes that your Santa will be as good to you as our Santa has been to us—and wish you great success and joy for 1928.


The Compliments Of the Season To You!
May the Best Things of the Season be yours this Christmas, and every Christmas hereafter. We sincerely hope the New Year is Bountiful to you in Good Health, Abundant Happiness and Prosperity.
ELLIOTT CORE DRILLING CO.
LOS ANGELES, CALIFORNIA

Fee, T. P. Thompson, Jr. 2
Fee, T. P. Thompson, Jr. 1
Fee, T. H. Kenneuy 2
Fee, South Penn Oil 3
Fee, South Penn Oil 1
Fee, South Penn Oil .....
Bingham, Hazelwood Oil 2
Bingham 400, South Penn Oil 3
Fee, South Penn Oil 2
Bingham 538, C. P. Byron estate 1
Bingham 570, South Penn Oil 2
Bingham 494, South Penn Oil 1
Fee, J. W. Bouton 1
Bingham 88, Sou.h Penn Oil 3
Bingham 398, South Penn Oil 3
Bingham 395, South Penn Oil ..... wtr
Bingham 395, South Penn Oil ..... b
Fee, T. H. Kennedy 6 2
Fee, A. Scherman 2 3
Bingham, T. B. Wilson 2
Bingham 453, South Penn Oil .....
Bingham 420, South Penn Oil .....
Bingham 439, South Penn Oil 75
Bingham 576, South Penn Oil 1
Garlock, L. H. Smith & Sons 66 2
Richardson, Hope Oil 3
Fee, W. J. Healy 2
Bishop, Kendall Refining 1 1
Boyd, Whitehead & Carson 2
Fee, Skagg Bros. 3
Fee, B. Devlin 1
Bingham, South Penn 2
Rew, Bovaird, Gallup et al 2
Jack, H. M. Jack et al 1
Melvin, South Penn .....
Kuhn, Davis Oil .....
Baldwin, E. E. Baldwin 2
Middaugh, A. L. & L. M. Lilly 1
Borden, T. B. Wilson 2
Borden, John Franks 1
Borden, M. & W. L. Wasson 2
Saunderson, A. Stover 2
Meldrum, A. H. Wiborg 3
Fee, D. L. Moody 2
Kuno Kuhn, Davis Oil ..... wtr
Kuno Kuhn, Davis Oil 3
Kuno Kuhn, Davis Oil 2
Werthman, L. G. Schenfield 2
Russell, C. E. Pot.er 1
Keating, First Natl. Bank, Olean 5
Burns Bros., L. A. Mazza et al 2
Burns Bros., L. A. Mazza et al ..... wtr
Fee, Penna. Oil Products Ref. 1
Weston, G. C. Rice et al 1
Rounds, J. W. Kaufman 10
Rounds, N. V. V. Franchot 8
Rounds, N. V. V. Franchot 5
Fee, North Branch Oil ..... wtr

Wells completed 115
Production 291
Water and pressure 16

MIDDLE FIELD

Jennings, Titusville Trus. 33 3
Foster, F. E. Keller 10 2
Foster, F. E. Keller 11 2
Lot 397, B. Hughes 6 5
Lot 7, J. G. Cochran 55 8
Lot 436, L. Epstein 43 6

Wells completed 6
Production 26

VENANGO-CLARION

Perrine, L. F. Perrine 17 1
Zimmerman, A., H. T. & W. T. Zimmerman 11 1
Porter, Halscel & Weekly 4 1
Carter, Halscel & Weekly 3 1
Lamb, Osborn, Hampton & Allen 18 1
Wise, Nesbit & Bell 35 1
Columbia, East Side, Pioneer Oil 9 1
Cooper, W. W. Wise 9 1
Eakin, Riddle & Co. 1, 2, 3 ..... gas
McNellie, Midland Oil Corp. 32 2
Wilbert, P. A. Wilbert et al 23 1
Mathews, Plum Oil & Gas 3 2
Keverline, Thomas McLaughlin 4 ..... gas
Hagerty, W. H. Hagerty 2 1
Kapp, A. Kapp 4 1
Sacks, C. C. Grimm 5 1
Clarion—
McCauley, Sigworth Bros. et al 1 ..... gas
Nick, Bashline et al 1 ..... gas
Moran, Beary & Co. 4 ..... gas
Kahle, A. D. Shorts et al 1 ..... gas
Kenemuth heirs, J. C. Elinger 1 1
Dittman, Ryberg, Ashbaugh et al 1 ..... gas
Gribel, Samuel Gribel 7 ..... dry

Production 17
Dry 1
Gas 7

BUTLER-ARMSTRONG

Jack, Beals & Freeman 4 ..... dry
Hickey, Greenwood et al 3 ..... dry
Gillespie, Waltman & Co. 1 1
Seybert, Selbert Bros. 1 ..... gas
Englehart, C. Fennell & Co. 1 ..... dry
Harmon, Wheeler et al 1 1
Hoch, Swartzlander & Smith 1 ..... gas
Keck heirs, Fred Kropeberg & Co. 2 1
Bock heirs, Frederick & Co. 1 ..... gas
Jorran, McCormick et al 3 ..... gas
Lewis, Sloan Rickard et al ..... dry
Terwilliger, Donaldson & Co. ..... dry

Wells completed 12
Production 3
Dry 4
Gas 4

ALLEGANY FIELD
Rigs

Fee, Barnes & Scott.
Fee, Empire Gas & Fuel, Ltd.
Cleveland, S. J. Cleveland.
Fee, Citz. Natl. Bank Wvs. 62.
Lee, LeSuer Oil Corp.
Fee, LeSuer Oil Corp.
McDermott, John K. Cochran et al.
McDermott, John K. Cochran et al.
Fee, Hazelwood Oil.
Fee, R-C-A Oil Corp.

Wells Drilling

Tract 1, Hazelwood Oil 69.
Boyd & Jordan, L. E. Jordan 5.
G. P. Reid, Agent, C. O. & W. O. Taylor.
Fee, Empire Gas & Fuel, Ltd.
G. P. Reid, Agent, State Bank of Bolivar 25 et al.
First Tr. Co. Wvs. 85, W. J. Richardson et al.
Fee, Hardman & Hardman.
Fee, Cuba National Bank 25.
Fee, L. W. Shaner et al.
Fee, Isaac Willets estate.
Birtcil, First Natl. Bank, Olean 13.
Fee, LeSuer Oil Corp.
Fee, LeSuer Oil Corp.
McDermott, John K. Cochran et al.
McDermott, John K. Cochran et al.
Fee, McDivitt et al.
Fee, McDivitt et al.
Fee, Chas. Phillips.
South Penn et al, First Trust Co. Wvs. 94.
Fee, Colegrove Oil, Inc.
Fee, Martin Bros. et al.
Fee, Cuba Natl. Bank 22.
Fries, N. V. V. Franchot, mgr. trust.
Kurtbhaltz, E. G. & F. W. Stephan.
Fee, Mary Lippert.
Fee, J. E. Miller et al.
Volk fee, Stephen-Gallets-Buffington.
Brown et al, Polley Bros.
Fee, H. C. & E. W. Miller.
Fee, L. V. Forness et al.
Garr, Laura H. Garr et al.
Kinley Oil, Staley & Luke.
Rigs, 10; wells drilling, 33; total, 42.

BRADFORD FIELD

Bing. 489, T. H. Kennedy No. 2.
Fee, South Penn Oil.
H. H. Redfield et al, South Penn Oil.
Fee, Mary C. Reidy.
Fee, Howard Wife.
N. V. V. Franchot, A. J. Crisman.
N. V. V. Franchot, A. P. Thompson, Jr.
Fee, South Penn Oil.
Bingham 453, South Penn Oil.
Fee, W. C. Kennedy Co.
Fee, South Penn Oil.
Fee, South Penn Oil.
Bingham 494, South Penn Oil.
Bingham 439, South Penn Oil.
Bingham 582, Associated Products.
Bingham 571, South Penn Oil.

Wells Drilling

Rew, Bovaird & Hamlin 21.
Bing, 296, Andrus & McDowell.
Bing. 489, T. H. Kennedy No. 2.
N. W. M. Ex. Co., S. P. O. 55.
Midland Keating, S. P. O. 47.
Davis, S. P. O. 34.
Bing. 88, S. P. O. 17.
Brooks, S. P. O. 03.
M. E. Jones, S. P. O. 243.
Newell, S. P. O. 09.
Chipmonk, S. P. O. 79.
Hooker, S. P. O. 27.
Melvin, S. P. O. 210.
Melvin, S. P. O. 209.
H. E. Smith, S. P. O. 151.
Bing. 533, S. P. O. 93.
Rew & Hodge, S. P. O. 54.
Lots 5 and 6, S. P. O. 52.
H. E. Smith, S. P. O. 155.
Bing, Satt., S. P. O. 129.
Bing, 400 acres, S. P. O. 89.
Bing, 450-474, S. P. O. 94.
Bing, Sott, S. P. O. 130.
D. M. Cotton, S. P. O. 67.
Culbertson lots, S. P. O. 68.
Bing, 439, S. P. O. 105.
Fee, South-Penn Oil.
Fee, J. G. McCandless.
Fee, W. T. Piper et al.
E. J. Burns et al, Holt & Latimer.
Clugston et al, Parker Farm Oil.
Fee, Hazelwood Oil.
J. B. Strong & Co., J. H. Hannon.
Fee, South Penn Oil.
Fee, W. C. Kennedy Co.
Bingham 400, South Penn Oil.
Bingham 184, Associated Producers.
Fee, W. H. McDermott.
Fee, Hilliard & Dodge.
Bingham 179, Hazelwood Oil.
N. W. Mining & Exch. Co., South Penn Oil.
Bingham 494, South Penn Oil.
Bingham 570, South Penn Oil.
Bingham 533, South Penn Oil.
Fee, J. W. Bouton.
Kennedy & Clarke, Mt. Jewett Gas.
Bingham 88, Sou.h Penn Oil.
Fee, South Penn Oil.
Fee, South Penn Oil.
Bingham 420, South Penn Oil.
Fee, V. G. Smith.
Ridell & South Penn, Pollock et al.
Fee, Skagg Bros.
Bingham, South Penn Oil.
Fee, G. A. Simpson.
Corwin, Simon Bros.
Booth, R. E. Porter.
McIvin, South Penn.
Kuhn, Davis Oil (2 wells.)
Baldwin, F. E. Baldwin.
Middangh, A. L. & L. M. Lilly.
Borden, M. & W. L. Wasson.
Canon fee, P. L. Golden estate 48.
Rounds, J. W. Kaufman.
Weston, G. C. Rice et al.
Weston, Mayrock Oil.
Bell, J. S. Brown.
Fee, Grow Farm Oil.
Rigs, 16; wells drilling, 69; total, 85.

VENANGO-CLARION
Rigs

Porter heirs, B. Porter 25.
Grazier, Bruin Oil & Gas 2.

Wells Drilling

McCalmont, W. L. & G. N. Hess 22.
Whid, R. F. Whitling 22.
Wilson, Hovis & Lamberton Natl. Bank of Franklin 21.
Columbia, East Side, Pioneer Oil 10.
McNellie, Midland Oil Corp.
Wilbert, P. A. Wilbert et al 24.
McLaughlin, Thomas McLaughlin 1.
Keverline, J. E. Keverline & Dempseytown Gas.
Clarion—
McKissick, Bashline et al 1.
Elder, N. T. Shorts 2.
Berlin, I. C. Hess 2.
Kohler, Roess, Kohler et al 6.
Howard, George Turn 1.
McCalin, J. C. Edinger 2.
Whitling, J. E. Howard and Stanley Whitling.
Best, Cushing, White, Slicker et al 2.
Ashbaugh, Shaffer, Yonkers 1.
Wentling, Dale, Sheffer, Hooker et al 4.
Amsler, H. L. Conver and Morgon 1.
Rigs, 2; wells drilling, 19; total, 21.

BUTLER-ARMSTRONG
Rigs

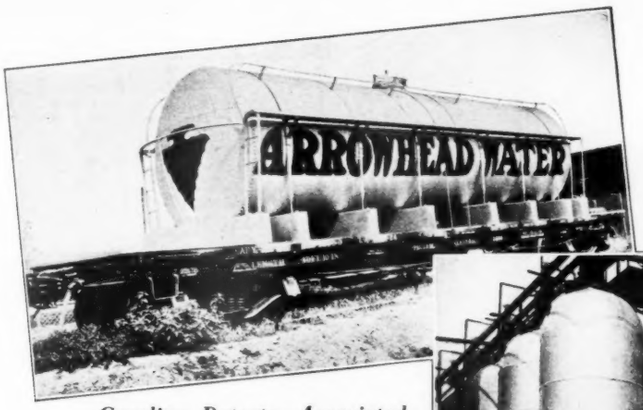
Wurtz, R. A. Marshall 1.
Marshall, R. A. Marshal 1.
Follsteadt, M. B. Cypher 1.
Smith, Row Smith et al 3.
Boggs heirs, R. C. & W. V. Binkerd.

Wells Drilling

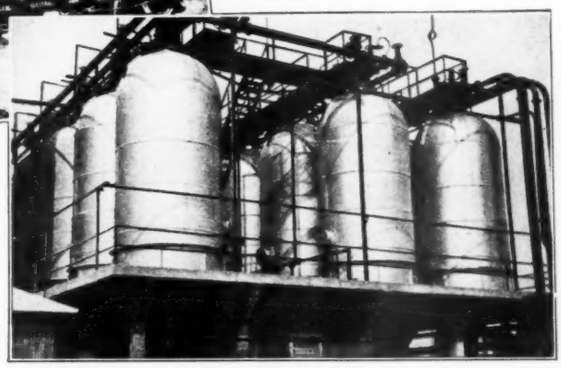
Walker, Saxonburg L. & H. 1.
Duility, Boyle, Maley & Co. 2.
Ritzert, Ritzert Bros. 1.
Bauldauf, Birckbichler & Co. 1.
Raisley, Wachsmuth & Co. 1.
Behm, Wm. Pfeifer et al 1.
Sharp, C. V. Sheffer et al 1.
Say, George Levier.
Gibson, J. C. Gibson.
Rigs, 5; wells drilling 9; total, 14.

MIDDLE FIELD
Wells Drilling

Emerson, G. L. Rhodes et al.
Johnson, Pennsylvania Gas 1,040.
Ulf, Fidelity Petroleum 1.
Siggins, E. Pequignot 2.
Foster, F. E. Keller 12.
Wells drilling, 5.



Water Tank Car — Pacific Electric Company, Los Angeles, California. 1 sprayed coat of Bitulumin.



Gasoline Retorts—Associated Oil Company, Avon Refinery, California 2 coats Bitulumin over 250 Iron Primer.

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From Moisture
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Keeping Tank
Surfaces Cooler.
For Many Other
Purposes, Too.

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FLUOR REDWOOD COOLING TOWERS

USE AND CARE OF GAS ENGINES DISCUSSED BY MANUFACTURER

By John Reid*
Joseph Reid Gas Engine Co.

As a general rule the manufacturer's knowledge of his engine ceases with the sale of the engine and it is only heard from in case of complaint. With the alleviation of this complaint and the insurance of long and satisfactory service in mind this paper is presented to those upon whom falls the obligation of installation, inspection, and care of the engine after it has left the factory or warehouse.

In purchasing an engine the buyer purchases horsepower. He must analyze his lease conditions very thoroughly so he may assure the purchase of sufficient power to efficiently meet his requirements. An engine cannot adapt itself to conditions which it is not built to meet.

The power needed to pump a well is a vague quantity. It is only in certain established fields that the quantity of power required is known and many factors, ordinarily unconsidered, go to make up power requirement conditions far in excess of the power need to merely actuate the rods and fluid.

With the advent of rotary tools holes are not so straight which means that, very often, the sucker rods must pull around bends with a friction out of all proportion to the power requirements necessary to lift the fluid. On some leases there exists a difference of 4,000 pounds starting load on wells of equal depths and tubing diameter.

Thought of the future work of the engine is especially necessary in fields where the wells flow for a period. When the wells cease to flow the engine is put on one of the hardest jobs it will have. The chances are that while the wells were flowing it has had but little use and just as little care and yet it is put under the very difficult strain of swabbing and when this has been accomplished it is put on the beam and expected to deliver full service, sometimes when 60 per cent of the fluid is water, and deliver this service when it is practically worn out through slight care followed by a period of very strenuous service in swabbing.

The altitude—the kind of gas, whether casinghead, sulphur or thin gas—the B.t.u. value of the gas—all these things must be considered and known by the buyer so he may be able to state his needs to the manufacturer who has but little knowledge of the buyer's specific operating conditions.

Setting the Engine

Blue prints or a templet or both are furnished with the engine for setting. The best setting for an engine is a concrete block. The engine should then be thoroughly grouted in. Some engines have grout holes left in the bed so the engine will set close to the concrete. The dam for the grouting should be high enough to raise the grout one-half inch or more up into the bed. The outer-bearing should be set in the same way. In such a grout it is usual to use a quick set.

Wood blocks are hard to keep lined, oil soaks under, and it becomes hard to keep the engine on them.

Gas lines should be of ample size to allow an easy flow of gas at low pressure sand it is desirable to have the air received through a strainer so that dust and foreign matter may be removed as far as possible.

Water circulation and lubrication are of paramount importance.

The tanks should be large and the installation designed to insure a continuous flow of water at all times.

Cooling System

In the thermosiphon cooling system the discharge pipe is under the surface of the top level of water. The difference in weights between the hot and cold water gives a ready circulation at all times but to insure proper operation of this system the discharge pipe must be kept beneath the top water level.

We have all noticed the bubbles which form on the bottom of a pan of water when the boiling point is reached. Under these bubbles is a pocket of air which serves as an effective insulation and prevents the water coming in contact with the metal.

The same thing happens in an engine and the water instead of bringing a uniform cooling surface to the cylinder will defeat its own purpose if the discharge pipe of the thermosiphon is exposed above the water. The siphon system is impaired and sufficient water will not flow to bear upon all parts of the cylinder. Violent ebullition takes place, the steam condensing at the mouth of the discharge pipe flows back into the jacket to be again converted into steam which is belched violently from the pipe in both directions. Cracked cylinders are certain to result from the action of the cold water coming from the tank and striking the cylinders after belching has taken place. Now, a check valve inserted between the tank and the intake of the cylinder will prevent the belching from exhausting through the intake pipe. It will also serve to keep some water in the jacket and when the flow is resumed after the ebullition there will be no violent contact between cold water and hot cylinder wall.

The side of the tank has an overflow from the bottom so that the heavy water is discharged with the addition of fresh water. The tank should always be filled from the top and drained from the bottom.

In the set-up for the centrifugal pump the discharge pipe may be over the top of the tank, there is the same waste system and check valve. The installation is practically the same so that continuous flow is insured.

Of major importance is the matter of lubrication. A better understanding must be had between those in charge of producing and refining so that suitable oils may be obtained.

Pumping Service

Related to the pumping of the well on the beam there first comes the swabbing. This is one of the most grievous punishments to which the gas engine is put. It is run at top speed, the swab jerked suddenly and dropped into the hole, often taking far more fluid than it should and in this manner bringing a sudden strain on the engine—strains sufficient to collapse the derrick and casing at times.

Pulling rods and tubing presents another problem of abuse to the engine. The engine is run hard and very often at top speed with no load. The operator will throw out the clutch and make no attempt to throttle the engine thus allowing it to run at full speed which literally lets the engine tear itself to pieces.

When applied to the beam, if the engine has had previous service, and good care, it only consumes about one-half its horsepower capacity and will give years of satisfactory service if properly cared for. It is much easier on all equipment if the pulley ratios are balanced and the owner will find this a very profitable investment.

In multiple or power pumping we recommend the four-cycle type of gas engine. There must be close enough governing of the engine to care for a wide fluctuation of load. The flywheels must be heavy enough to carry over the peak and steady the engine during the unbalanced cycle or during a period of no load. The engine mechanism should be balanced so as to prevent a racing cycle.

Care of Engines

Before making specific reference to the care of a gas engine I wish to make an observation covering some tabulated engine trouble reports which have come to my attention. One report covers 500 engines operating 2,023 wells for one

*Before American Petroleum Institute, Chicago.

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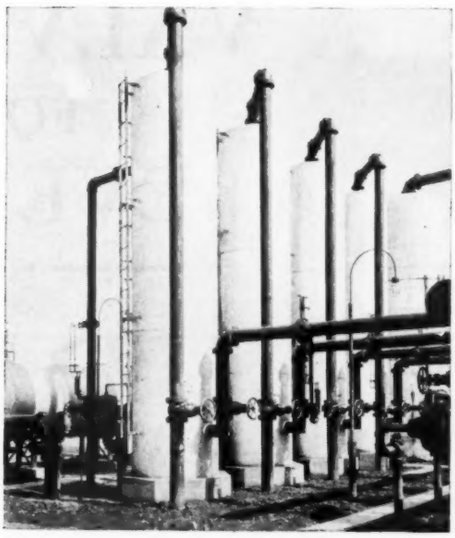
In the process of living through 1928 may efficiency and economy guide you to greater profit in every undertaking



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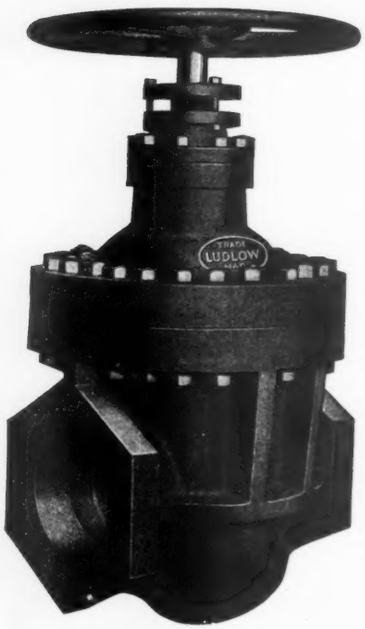

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month. Out of 194 shutdowns ranging from 48 to 1 hour there was only one shutdown of 1 hour to inspect one out of these 500 engines. It was also observed on one engine that there was a shutdown to tighten the bearings. This took three hours and there was no record of the engine having been shut down again to be rebabbitted. There were, however, records of several engines being shut down from 5 to 24 hours to rebabbitt the bearings and on these engines there was no record of the engine having been shut down for inspection or adjustment. Proper care will pay dividends in time, money and production.

As with the automobile, so with the gas engine — once the product is purchased the care of it falls upon its owner as must the penalty of neglect.

Before the manual details of proper care can be accomplished it is necessary to instill into the personnel of the lease a correct spirit regarding the attention to be given the engine and the establishment of proper relationship as concerns all immediately connected with the operation of the prime movers in the field. Now, as concerns the actual operating care. On installation the alignment of the engine is important. To keep it aligned is one of the primary considerations. Long experience has caused us to develop a device which will test the alignment of the outerbearings.

The device, which can be carried in a grip and weighs about 4 pounds is clamped to the shaft with the telescope rod drawn out to extend slightly beyond the diameter of the flywheel.

Testing Alignment

It is customary to start the test with the crank drawn toward the cylinder. By using the tool steel point as a prick punch a slight blow will mark the flywheel. Using the point as an indicator the wheel is rolled from one end of the stroke to the other. It is obvious that the measurements must agree from the fly wheel to the end of the test bar arm if the bearing is in line. When the bearing is brought into a position at right angles to the center line of the engine the wheels should be turned to a position midway between the ends of the stroke. The bearing must be raised or lowered to make this measurement agree. When the three measurements coincide the bearing is in line.

Misaligned and improperly adjusted outer bearings are certain to result in damaged shafts and destruction of the bearings and with this simple test these may be corrected and trouble avoided.

The journal bearings of the crankshaft demand particular attention. Neglect of these results in costly damage in broken crankshafts and rolled, scored and completely burned out bearings not to mention the cost in time and loss of production for the installation of a new crankshaft.

In a loose bearing the shaft centers change as the bearing becomes worn and the bearing grows larger due to the intense wearing away and rolling out of metal as the strain of the shaft shifts from place to place rather than being evenly distributed over the entire surface of the bearing. These strains increase as the projected area of the bearing decreases. The crank tends to wear into the sides of the bearing box and the strain of the crank as it begins to bend destroys the cap and bearing. The crank tends to warp and spread, the strains becoming greater and greater until fractures occur either in the arm or the bell at the indicated points.

Tight Belts

This may be entirely eliminated by a little attention to the journals. They should be kept snug at all times. If either cap is loose it should have immediate care. The forces leading up to a broken crank accumulate and a crank breaks little by little, over considerable time.

Directly related to outerbearing and crankshaft failure but not ordinarily attributed to it is the problem of the tight belt. I have seen a belt with a 45-foot center support four men and be deflected only 3 inches. At the speed belts are run it is readily seen that there is enormous pressure created, disastrous to outer bearings which, as a rule, have light foundations and to the cranks which suffer directly proportionally with the bearing.

Thomas F. Smiley, in The Oil and Gas Journal, under an article headed "Technicians Transform Oil Methods," quotes a report of the Pure Oil News which gives engine trouble at 6 per cent and belt trouble as 7 per cent from the total of all trouble. Now it is quite likely that part of this engine trouble might be charged to the bearing, due to the fact that it was through belt neglect or misuse that the engine was shut down.

In addition to the effect of tight belts on the crank and bearings it may be said that it causes overheating of the pulley force. This tends to expand it and draw it away from the spokes causing fractures which destroy the pulley. An instance may be cited where misuse of the belt had wrecked nine reverse rigs. Upon examination it was found that the operator was using inner tubes as belt dressing and had applied so much that when the reverse was thrown the belt could not release but carried through in the same direction but underneath the pulley thus bringing a strain sufficient to wreck the rig.

Tight belts must be avoided to insure proper service both of engine and belt and wherever possible large diameter pulleys should be used in conjunction with wide face belts.

Choice of Oils

The very important matter of lubrication must be given close attention. A table is herewith given showing the choice of oils which should prove satisfactory in the use of the gas engine.

	Pennsylvania or Other Mineral Base Oils	Western Oils Asphalt Base
Gravity	25 to 28 B.	20 B.
Cold test		0 F.
Flash	400 to 410 F.	360 to 380 F.
Fire	480 to 490 F.	405 to 425 F.
Vis. at 100F.	360 to 370 Sbt	515 to 570 Sbt

Too much oil should not be used. It builds up carbon very rapidly in the cylinder and clogs the ports. It will build up underneath the piston rings causing wear on the cylinder, the piston to seize, the rings to stick and allow the charge to blow past the rings. Cylinders have been known to be worn one-quarter inch and still give service, but lack of the proper care in lubrication was eventually costly.

A good grade pure mineral oil should be selected for the engine and the operator should be observing enough to judge the proper amount of oil to give his engine. One 40-horsepower engine that record has been kept on has consumed only one gallon of oil to 600 or 700 horsepower hours and in this case no attempt was made to conserve oil.

Buyers of the gas engine have been demanding a splash system on the engine and have been far from favorable to the force feed system. In automotive motors the trend has been more and more in the opposite direction, the demand being for the force feed system. It is imperative to watch the oil level closely on the splash system and it requires a greater amount of clean, fresh oil.

REGISTRATION HOLDS UP

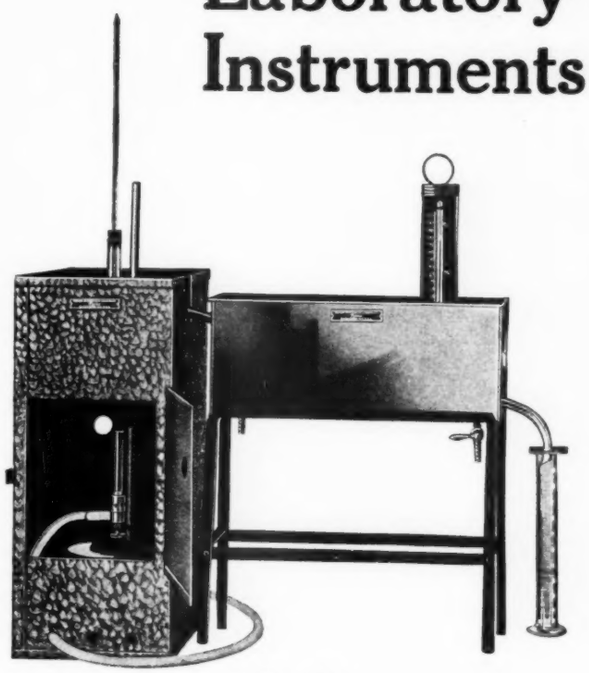
Virtually as many passenger automobiles were registered in October as in September, according to reports from 42 states as compiled in Detroit, which showed less than normal seasonal shrinkage. Excluding Ford, October showed a slight gain over September.

VENEZUELA MORE ACTIVE

WASHINGTON, D. C., Dec. 17.—Resumption of drilling and construction activity in the Maracaibo Basin, Venezuela, is expected in the immediate future, the Department of Commerce has been advised in a report from the American Consul at Maracaibo. Transportation difficulties are somewhat relieved by recent tanker additions.

Tycos

Laboratory Instruments



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Christmas Day, but every day. For his equipmen
. . . but lives long in the hardest, most gruelling
to him, and to us, well justifies the most skillful

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Low Cold Test Blending Bright stocks are getting these results for a rapidly growing list of prominent Jobbers and Blenders.
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Fire 510-520
Vis. @ 210.....80-90
Cold Test 10-20
Color .....6-7 NPA
Carbon Res. Under 1.5%
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Gravity 23-25
Flash 490-500
Fire 565-575
Vis. % 210 120-130
Cold Test 10-20
Color .....7-7½ NPA
Carbon Res. Under 1.5%
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COAL AND OIL COMPANY
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DEEP DRILLING IN LOGAN COUNTY; TRYING PROBLEM IN LOVELL FIELD

By J. L. Dwyer

Much has been written about deep drilling, and its inception, expansion and tribulations have furnished the subject of a generous share in the technical and semitechnical literature of the petroleum industry. The main trouble has been that the volumes have hardly been off the press before new conditions have rendered them obsolete, for in no other instance of the oil industry and its problems has a more rapidly changing perspective been presented.

From the early Oklahoma fields where a 2,000-foot test was a great hazard, the scene shifted to Cushing where 2,900-foot drilling was the rule. The Okmulgee district furnished numerous pools with good Dutcher sand output found around 2,700 feet, and then in rapid succession came Tonkawa with its 2,300-foot level, Burbank where 2,800 feet found the Bartlesville sand, and in the south country, the Cromwell and Wewoka Pools with 3,400 and 3,100-foot horizons respectively.

After the 3,000-foot level in wells was passed, there was a lull of a few years before the next thousand feet became the rule for wildcat ventures. As late as 1924, a 3,000-foot test was considered a fair test in central Oklahoma where subsequent experiences have taught that this depth lacked 900 feet of finding the Hunton lime. The Stroud Field of Lincoln County furnished Wilcox sand production at 4,000 feet, and was followed by more Wilcox oil at a similar depth at Tonkawa and Wewoka. The Garber Field of Lincoln County found Wilcox or Siliceous lime (as you will) oil at 4,400 feet, and then came Seminole with an average depth of 4,200 feet.

"Mile and Half Drilling"

These developments have been dwarfed in depth by the Lovell Pool of Logan County, western Oklahoma, which was opened last spring by the Roxana Petroleum Corp. and in which some wells now drilling are approaching the pay sand. The Lovell Field has been called mile-and-a-half drilling, for in this area the depth of the Wilcox is 5,800 feet.

This great depth caused a natural hesitancy to rush drilling at Lovell, for even the most substantial companies are inclined to hesitate before driving the location stake when the cost of a completed oil well is estimated at $150,000 and a completed dry hole at $100,000, as is the case at Lovell.

Drilling contractors have small cause to rejoice at the prospects of having their

(Continued on Page 91)

The Lowell Field of Logan County, Okla. Deepest production in the Mid-Continent.

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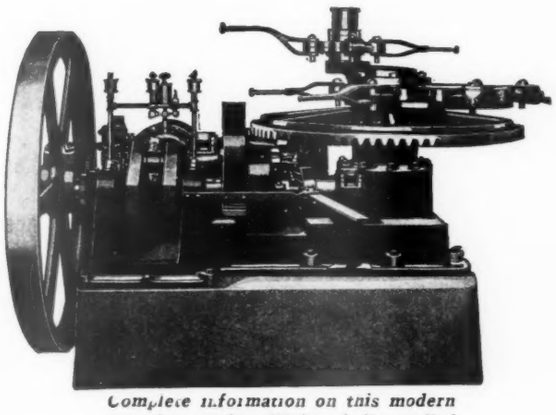

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1. Spur gears are cut from the solid and run very quietly.
2. Clutch Hub is of steel, and the pinion gear cut from solid steel.
3. Engine crankshaft has an O.B. bearing cast on the bed plate and is self-contained.
4. Lever clutch is mounted on engine shaft, is fitted with wood shoes, and will carry the heaviest loads without slipping.
5. One large oil reservoir on disc pin oils the complete outfit.
6. The engine is fitted with Wico igniter, but if preferred, a tube ignition can be furnished.
7. Built in 15 and 20 H.P. sizes, also 8 and 12 H.P. single disc.

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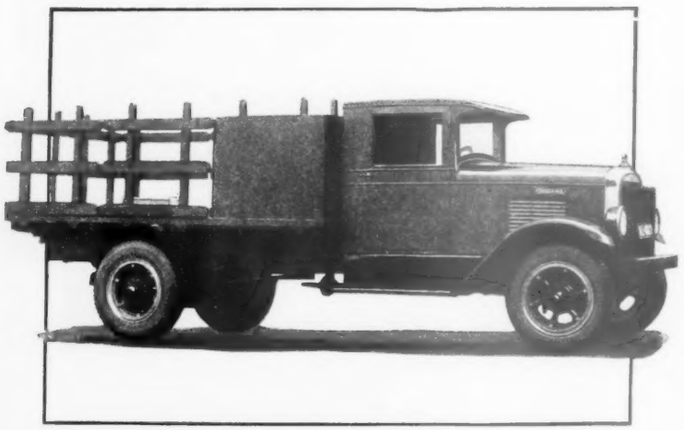

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END CAT AND MOUSE PROCEDURE IN ANTITRUST LAW ATTITUDE

By T. K. Schmuck*
The Texas Company

American politicians, possessed with the idea that the way to benefit the public is to force lower prices, might do well to consider the calm conclusions of English judges divorced from partisanship and unswayed by popular clamor. "An ill-regulated supply and unremunerative prices, may in point of fact, be disadvantageous to the public. Such a state of things may, if it is not controlled, drive manufacturers out of business, or lower wages and so cause unemployment and labor disturbances.

"While low prices may be good for the public for the time, they are not a benefit if all the suppliers are thereby ruined."

The Seminole situation of a few months ago shows the perplexity confounding law-abiding men when the law of self-preservation compels some sort of combination and the law of the land neither has approved nor disapproved the combination demanded by the exigency.

Here was overproduction and low prices. But are low prices a boon to the public when caused by an overproduction of irreplaceable resources and when that overproduction is ruinous to the producer? How was this overproduction to be stopped? No producer acting independently dared to stop or to reduce production. If he did, the vagrant character of oil might forfeit it, by drainage, to that neighbor willing to continue producing.

Obviously, the only remedy was concerted action or government intervention, provided the Government could and would intervene, or both. Government sanction spared producers the necessity of purely private decision.

A similar situation may arise again and it may be well to consider the possibilities.

I do not think that government regulation is necessary. I am sure it is not wise.

Economic law and innate good sense will remedy such a case quickly enough if men are allowed a reasonably free hand in the conduct of their affairs. Provided the rule of reason is applied sensibly to test the lawfulness of trade restraint created by a concerted limitation of production, producers in straits like those of the Seminole producers can combine to limit gross overproduction without danger to themselves. The exigencies of each case will determine whether it is right to combine and how far control can be exercised properly. Of course, this will not relieve the producers from the hazards of an erroneous decision. But I am convinced that concerted action will never be attempted until such a time when right-minded men must agree that it is proper. So far as I know, the public greeted limitation of Seminole production with general and undissenting approval. This, I think, carries assurance that similar approval would have met concerted action had the industry been compelled by necessity to act without state sanction.

Maybe development of natural resources is a proper subject for government regulation under this or that constitutional prerogative, Maybe not. But whatever is the truth of this, both state and Federal Government, undoubtedly, have power to establish some method for testing the propriety of trade restraint brought about by concerted limitation of production otherwise than by cat and mouse procedure. By cat and mouse procedure, I mean watching until an unwary victim has overstepped the law and then pouncing upon him.

I do not think a new law or a new bureau is necessary. The existing law affords the public ample protection against undue trade restraint, and if interpreted sensibly, allows the individual sufficient scope to protect his legitimate interest. This, coupled with man's natural disinclination to pauperize himself, guarantees against too wasteful exploitation of our resources.

Pesterment is no function of Government. One of the chief considerations of Government should be to allow the individual the maximum liberty in conduct of private affairs consistent with the public interest. Certainly this industry is, at least as well qualified as officialdom to reach a fair decision as to whether its needs are compatible with general welfare.

*Extract from address before American Petroleum Institute, Chicago.

KENTUCKY-TENNESSEE

(Continued from Page 50)

tional wells on other tracts owned by Hayden, the two other Hayden farms being near the hamlet of Maxwell. These wells will be drilled as soon as material can be moved to their locations.

The trade is watching closely the well being drilled on the Westerfield property, in Ohio County, between Pleasant Ridge and Buford, by Marvin Jordon and others. This well is along the same lines as several other wells in this county, and while it is a wildcat venture, has more probability of striking oil than many of the other advance wells in that part of the Tri-County Field.

Another wildcat test attracting attention is being drilled by unknown parties on the Burdette farm, a couple of miles north of the good production on the Bob Hamilton farm, and if it proves a commercial producer will mean quite an extension to the north and east of development. The new test is not far from the town of Adaburg, in Ohio County. No. 2 well on the Hamilton farm is making a fine showing and is estimated good for around 200 bbls. initial, but not as yet on production.

Extend Pipe Line

Announcement is reported made by the Illinois Pipe Line Co. that pipe has been ordered for extending the service from the old field down to the Steele well at Buford, across to the Gilbert Jolly well, about 2 miles west, then to the Hayden well 3 miles northwest and back down to the Dimmick well, beyond Liva and Utica, in McLean County. Work on this extension will commence as quickly as the service pipe arrives. This will cover approximately 10 miles and will be of big service to these new sections of the oil field and will also bring about a big drilling campaign along the new extension, which looks to be along a rich belt of oil. Close to 1,000 bbls. of oil have been taken from the Hayden well which has not yet been shot because of no pipe line facilities, while the Dimmick well is ready to pump as soon as the pipe line is completed and is said to be good for 80 bbls. The Jolly farm well has filled two 100-bbl. tanks and they are putting up additional storage. A well will start at once adjoining the Jolly well on the Austin Tucker farm.

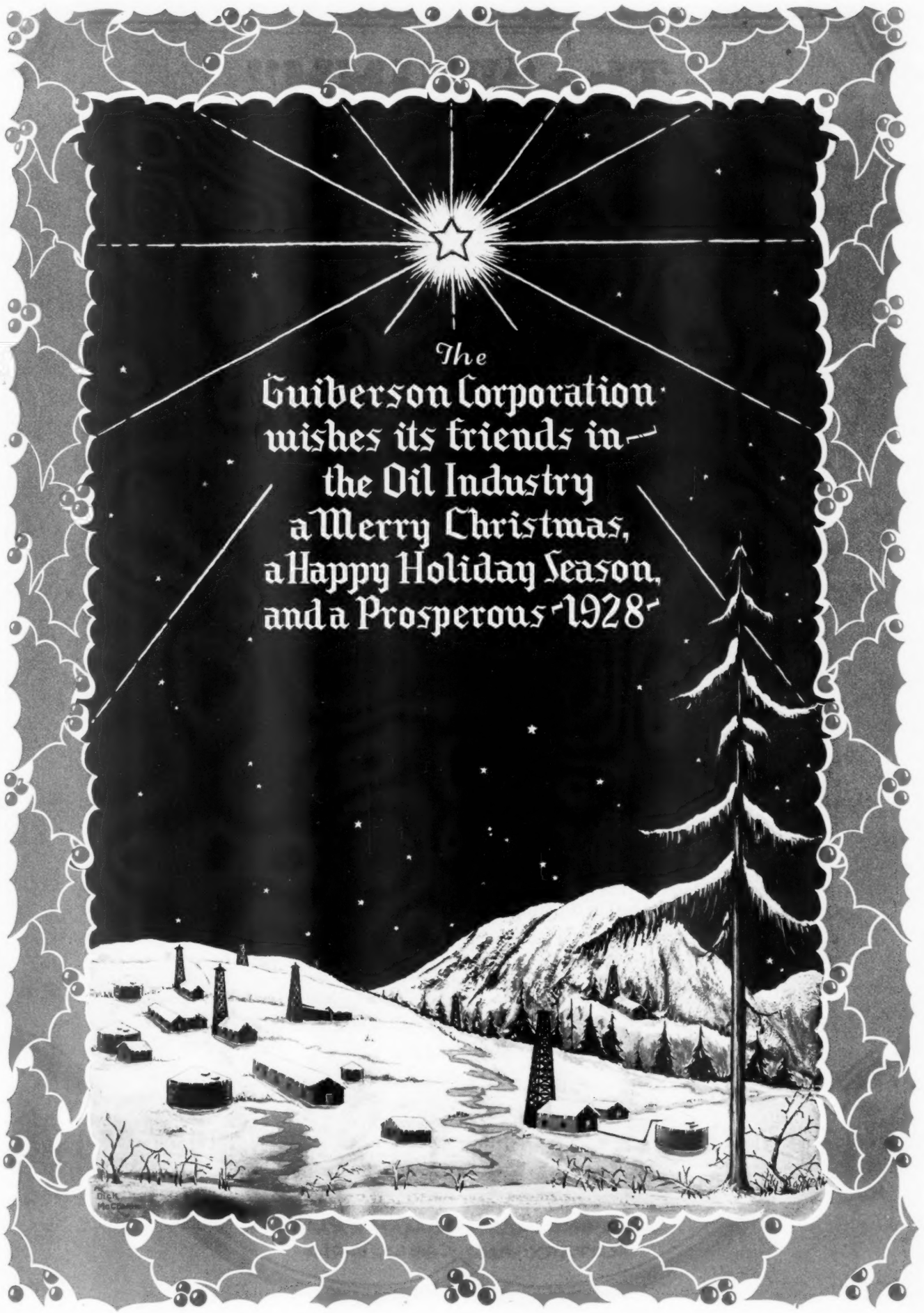
Late Ohio County Wells

Yewell, Kelly and others' second well on the Bob Hamilton 350 acres, near Mount Moriah and southeast of the Ambrose Pool, in Ohio County, is reported at 200 bbls. initial and looks as rich as the Ambrose Pool, making Ohio the outstanding oil county of Kentucky at this time.

Daugherty and others' No. 4 on the Hill Rhodes 150 acres, in the Ambrose Pool showed an initial of 150 bbls. In this well a string of 717 feet of casing was set, sand from 717 to 748 feet and drilled to a total depth of 756 feet and shot with 100 quarts.

Creek Drilling Co.'s No. 3 on the Bartlett heirs farm, at the southern edge of the Ambrose Pool, is reported at 35 bbls. initial.

In the Colyer Pool, S. H. Russell and others set a string of 404 feet of casing in No. 3 on the A. P. Kelly farm, found sand at from 404 to 440 feet and went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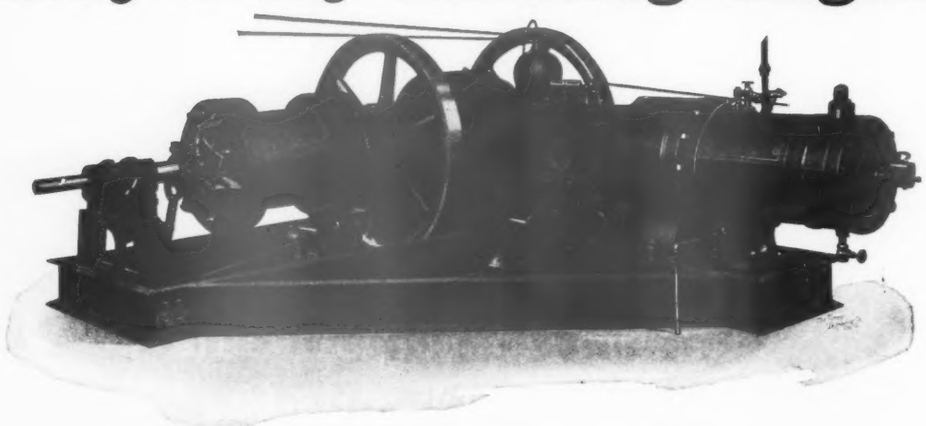

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The type OSS "Primm" Oil Drilling Engine has been specially designed for oil well drilling and the severe stresses, strains and shocks encountered in such work from spudding in to pulling casing.

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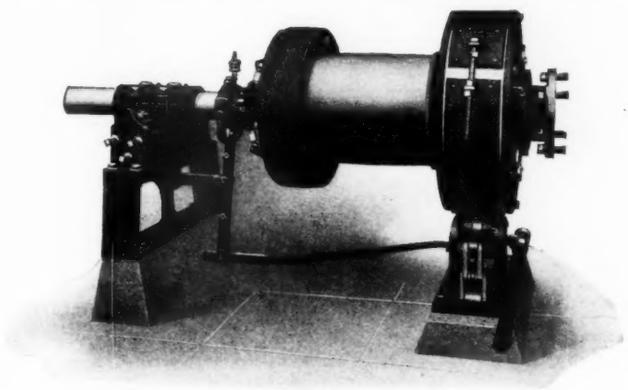

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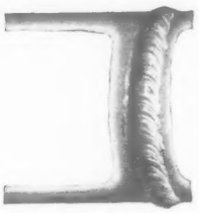

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MADE IN SCOTLAND

to a total depth of 445 feet and, shooting with 60 quarts, the initial production being 20 bbls. Same parties got a dry hole in the same pool in a test on the Joe Bellomy farm.

James C. Ellis drilled in his second well on the Rosseau Weller farm, near Mount Moriah, southeast of the Ambrose Pool, getting what is reported an initial producer of 100 bbls.

In the north end of the county, H. A. Henry's No. 5 well, 200 feet from the north line and 600 feet from the east line of the S. V. Flowers 32 acres, is good for 20 bbls.

The Penn Indiana Oil Co. drilled in No. 4 on the William Griffith 270 acres, in the Colyer Pool, getting a 25-bbl. initial producer. A string of 412 feet of casing was set in this well, sand at from 412 to 435 feet and sent down to a total depth of 440 feet and shot with 60 quarts.

In the King Pool, north of the Ambrose Pool and west of the Midkiff Pool, the Ohio Oil Co. drilled a dry hole in a test on the W. T. Greer 55 acres.

Allen County

E. E. Hume drilled a dry hole on the Levi Hinton farm, in the Gainesville Pool in the northeastern part of Allen County, at a depth of 312 feet.

Warren County

Thompson Oil Co.'s No. 8 well, 500 feet from the north line and 1,050 feet from the west line of the H. M. Bryant farm, southwest of Bowling Green, in District 4, Warren County, pumped an initial of 2 bbls. at a depth of 1,150 feet.

Tennessee

The Celina Field of Clay County is looking up, as are all the surrounding counties in that section of Tennessee, but whether or not development work will continue at any great pace remains to be seen, as the closeness of the holiday season and the coming of the midwinter may bring a shut down to some extent.

There is a large area of this part of Tennessee which is pretty well proven for oil production and the operators that are in the field are slowly but surely developing a wide area and as soon as crude prices recover Tennessee will be heard from in the way of some very fine wells as all the old-timers that have drilled these pools know the oil is there.

The Mill Creek operators in Clay County are now shipping oil as the Paragon Development Co. has extended its gathering system to the upper pool and Stoll Oil & Refining Co. of Louisville, Ky., has connected its gathering system to the Ohio Oil Co.'s properties in the lower pool, and several new wells will be drilled at once in this pool as a large area is already proven for production.

The Ava Oil & Gas Co., of Ava, Ill., a large oil and gas operating concern in Jackson County, Illinois, has entered the Tennessee Field and is now drilling No. 2 on the Bob Riley farm, near Fox Springs, in Clay County, where it recently secured a fine production on the Mary Williams farm, with four wells. Last reports are these four wells are still producing in excess of 100 bbls. daily and so far are among the best producers drilled in this section of the State having already produced around 30,000 bbls. of oil which has passed through the Paragon pipe line. J. S. Aber is drilling his No. 1 G. B. Gates farm, across the road from the James Arms farm where six straight producers have already been drilled in. These wells are in the Peterman's Bend Pool, 1 mile east of Celina, in Clay County.

In the same county, the Hughes-Rife interests are drilling at 800 feet at No. 1 on the Waddle farm. The Ohio Oil Co. just drilled an offset to this well making 8 bbls., said to be No. 3 on the Pennington farm, but this company, being desirous of testing the lower pay at the base of the Knox Dolomite, is carrying this test to about 1,600 feet, as this lower sand is found in that area at a depth of 850 feet below the Pencil Cave. Two or three tests have already been drilled to this horizon and all showed oil, while one was a commercial well at 1,335 feet on the Arch Short farm east of Celina. The Hughes-Rife interests are preparing to start a well near Spivey on the J. W. Woods farm and it is believed by many of the oil people a new pool will be opened there. Spivey is near the northwest corner of Clay County, northeast of Red Boiling Springs and not far south of the Kentucky-Tennessee line.

H. C. Kraft and James McDonnell of Lima, Ohio, and Oblong, Ill., completed their No. 1 Thompson farm, on Mill Creek at a depth of 514 feet and it will make 20 bbls.

Clark, Bovar and Shirk have completed No. 1 Tidwell heirs farm, on Mill Creek, at 452 feet. This well will make 25 bbls. natural. Mr. Ackerman, of Illinois, is getting ready to start his No. 1 on the Francis Langford farm, on Mill Creek.

The Carnahan Oil Co., with Mr. Horn as manager, has No. 1, the big well on the Turner Clark farm on Ashburn Creek, connected to the Paragon pipe line and the well is making over 100 bbls. a day, flowing natural. Same company's No. 1 on the J. L. Moredock farm, across the creek from the Turner Clark well, got a 20-bbl. well at a depth of 180 feet, which is in the Fannie's Creek sand. This well has been put on production and the drilling outfit is being moved to the Kimes farm for No. 1 well.

H. L. Ogle, of Ohio, a producer in Barren County, Kentucky, has started his No. 1 on the Mrs. Wilburn farm, which adjoins the Turner Clark farm, where the Carnahan company got its big well.

Parties from Drumright, Okla., are planning to start a well northeast of the Peterman's Bend Pool on the A. P. Nevins farm. J. W. Young, an old-timer, visited the field during the week with some southern Tennessee men preparing to start a well on some of Mr. Young's holdings near Kettle Creek. This test will be drilled on the Jake Short farm, where one good well has already been completed. Unknown parties are drilling a well on the John Overstreet farm on Kettle Creek, and Charles Gartland is drilling No. 1 Blythe farm, also on Kettle Creek.

Clark, Bovar and Shirk are starting a second test on the Tidwell heirs farm, and J. S. Aber is starting No. 3 on the Barlow Langford farm, in the Mill Creek Pool.

Burman & Price's well on the Arch Short farm, east of Celina, is reported around 10 bbls. at 1,335 feet.

Turner & Lewis drilled in a dry hole in the Jouetts Creek Pool, in Pickett County, on the B. C. Arney farm.

Blick and Blick, better known as the Celina Oil Co., who opened the Rad Hawkins farm pool in Jackson County, are back installing power and pumps and will start the nine producing wells they have on the lease. No. 9 is reported approximately 30 bbls. initial production. This is another of the best pools opened up during the past year or so in Tennessee.

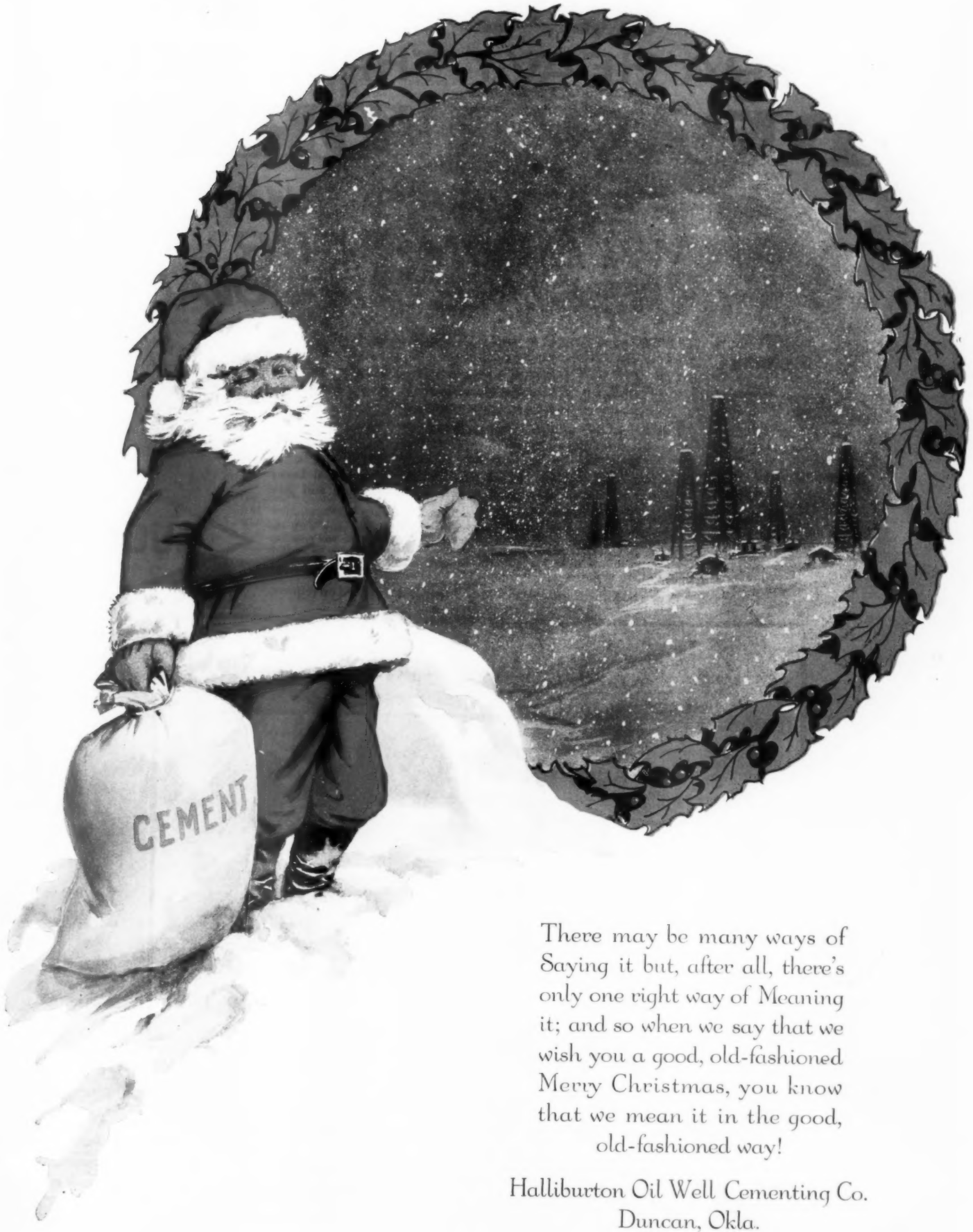
The Medlin Oil Co., of Geneva, Neb., have just completed their second dry hole in DeKalb County.

Akron, Ohio, parties are in the Celina area talking to contractors on the drilling of a 2,000-foot test to be drilled in Van Buren County, which is in advance of the present field, but will be a most interesting test.

Alexander and others are starting a test on the highway between Cookville and Livingston, Tenn., near the Spring Creek wells in Overton County.

TEXAS OIL ROYALTIES

AUSTIN, Tex., Dec. 17.—Payments of royalties on oil production on lands owned by the University of Texas, made to that institution in November, aggregated $251,000, compared with $263,823 in October. Total sum received by the university from oil royalties is now $7,652,619, all of which has been invested in Liberty bonds. The November payments included Magnolia Petroleum Co., $5,585; Humble Oil & Refining Co., $28,719; Big Lake Oil Co., $72,459; Texon Oil & Land Co.; $21,641; Atlantic Oil Co., $72,763; Pecos Oil Co., $10,695; Gulf Oil Corp., $3,925; The Texas Company, $607; Tidal Oil Co., $21,088; Prairie Oil & Gas Co., $13,513.



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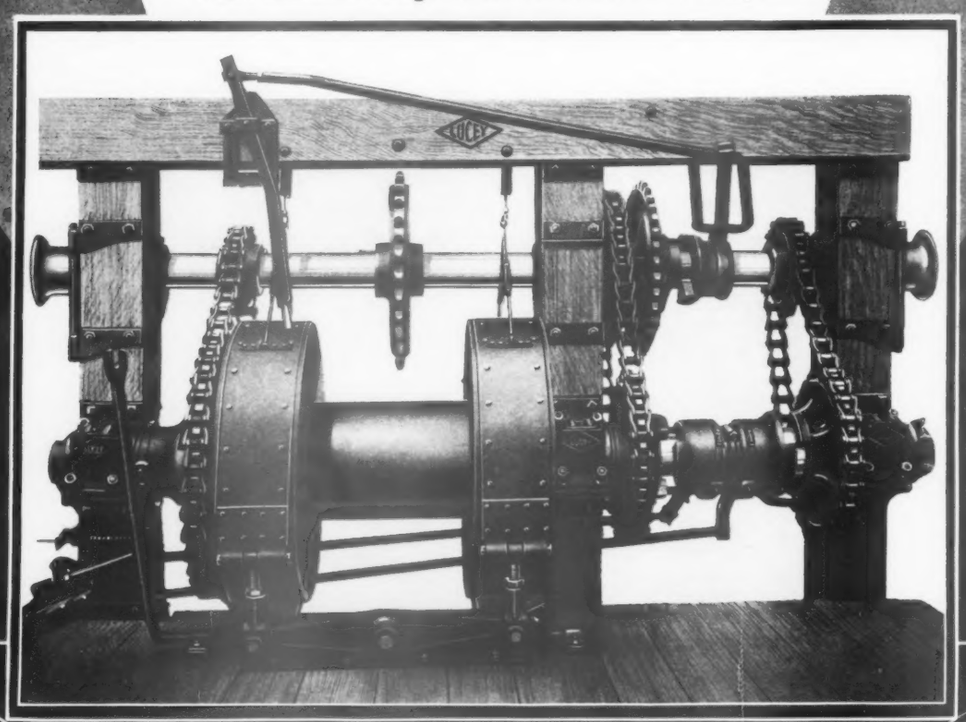

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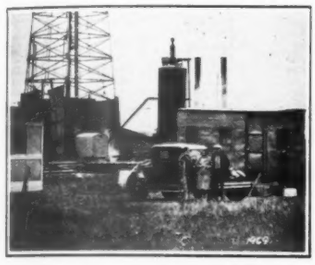
DEEP WELL DRILLING IN LOGAN COUNTY

(Continued from Page 82)

tools at one location for eight months, and this is the drilling time which is estimated for the Lovell area.

The discovery well in this pool was drilled into the sand on May 17, 1927, by the Roxana Petroleum Corp. It was located in Section 30-19-5w, as shown on the accompanying map. It had an initial output of 2,800 bbls. daily and after almost seven months of productive life is still making 2,300 bbls. per day. The large body of sand penetrated (and this has caused much discussion) is believed to be approximately 140 feet, and was found from 5,845 to 5,985 feet. There were grains of sand found from 5,808 feet, but the top of the Wilcox is believed to be around 5,845 feet in this well. This large body of sand is naturally responsible for the steady performance of the well which is almost constant at 2,300 bbls.

After the well had held up remarkably well for a time, the owners of adjoining leases started their operations, and at this time there are 12 active operations close to the Roxana well. The total cost



The driller has a home on wheels, and moves from well to well.

of these 12 wells will be around $1,800,000, and their progress is a matter of much interest, for naturally with the new depth there are new conditions to be met in drilling.

Extraordiary Conditions

From the derrick foundations to the last detail of supplies the equipment at the Lovell Field has been designed to meet the extraordinary conditions of pressure and depth which are caused by 5,800-foot drilling. The majority of derrick legs have been reinforced both inside and out, and when it is considered that they are destined to handle loads of casing weighing as much as 130 tons this is not surprising.

Several new records for length of casing strings have been made in this part of the State. The previous mark was a string of 4,200 feet of 8-inch pipe run by the Marland Oil Co. near the Thomas Pool in Kay County. Within the past 10 days, the Sinclair Oil & Gas Co. ran 4,775 feet of 8⅝-inch casing in one of its drilling wells at Lovell. This stood as a record for a few days, but since then the Roxana Petroleum Corp. has run the longest string of casing which the Mid-Continent Field has witnessed. It was 5,802 feet of 8⅝-inch casing, and was run close to the top of the Viola lime. The casing had a weight of 45 pounds per foot, and this made a total weight of 130½ tons which the derrick and casing equipment had to handle. The string of pipe was run without accident, although considerable time was taken in preparing for the running.

When the wells were first started, it was the original intention of the operators to run two strings of casing, a string of 8-inch at 4,800 feet, and a string of 6-inch close to the Viola lime.

The Roxana corporation, however, decided to carry its large pipe as far as it could, and the result is the figure mentioned above.

Heavy Cost

Every item of material in the Lovell Field represents a heavy cost. The rigs completed and built cost $10,000 each, and the 12 finished rigs represent an investment of $120,000. As both rotary and cable tools are used, the rigs are of the combination type. The rig cost is $6,000, and the remainder is represented in the extra work of reinforcing and construction.

The cost of fuel and water is another item of no small consequence in drilling this field. The gas which is used for boiler fuel costs $75 per day, while water necessary for the rotary drilling costs $40 per day. This makes a combined water and fuel cost of $115 per day, and it has been estimated that eight months will be the average time required to drill the wells. At this rate they will have a total water and fuel cost of $27,600, and it might be recalled that a few years ago, this sum would pay for the completion of a Wilcox sand well.

The problem of drilling has been a trying one at Lovell. When the first wells started, drilling contractors agreed to take $9 per foot for the work, but when trouble developed, and the contractors were confronted with staggering losses, the operating companies almost all agreed to sustain any losses incurred by the drilling. At $9 per foot, the drilling cost alone would have been $53,100, and under the current conditions, it is estimated that the drilling costs on the wells will be approximately $75,000 per well.

The next 30 days should witness the completion of three of the drilling wells, and additional information about this pool should be available.

Lovell Pool's Story

The Lovell Pool was the first big production for Logan County. Its geographical position is 20 miles southwest of the Garber Pool of Garfield County, and the first exploration work in this region was done by the Roxana corpporation which operated the core drill, and found good structural conditions. After preliminary work the Roxana corporation acquired 2,500 acres of leases and the well was started in the spring of 1926.

The finding of oil in this field extended the producing region of northwest Oklahoma, and gave an added interest to the Logan territory which had been under careful observation for several years with a limited result. This part of the state had been a prosperous farming community prior to the advent of oil. The farms of the region have substantial houses and barns in sharp contrast to the scene where oil is found in east central Oklahoma where the chief product is cotton, and the farmers eke a hard living from the soil.

Transporting the material to the field has been done mostly by shipping from the railroads which run on either side of the field. The city of Guthrie seems to be the headquarters of many who operate in the field, and the material is transported from the towns of Hennessy, Marshall and Crescent all of which are within 15 miles of the pool.

Some novel living conditions have been arranged by members of the drilling crews who are pictured above. To solve the problem, one driller has established a very comfortable home on a chassis which carries the "Pride of Detroit" for motor power. He is thus enabled to change his place of residence by merely stepping on the starter. The living problem is simplified by this means, and additional comfort found in the hot meals which are always available, and which replace the dinner pail so common to drilling crews, but those familiar with the sound of rotary outfits cannot but remark that the driller and his family certainly must have a liking for music.

"UNCLE PEG" DIES

Frank Miller, 51-year-old oil driller, a familiar figure about the oil fields of Texas for many years, passed away at a Houston hospital, December 10. He was nicknamed "Uncle Peg" by his many friends among the oil workers of Houston after he lost a leg in an accident while on duty some time ago. He was active during the Spindletop oil boom in 1901, and worked in three or four states as well as in Texas.

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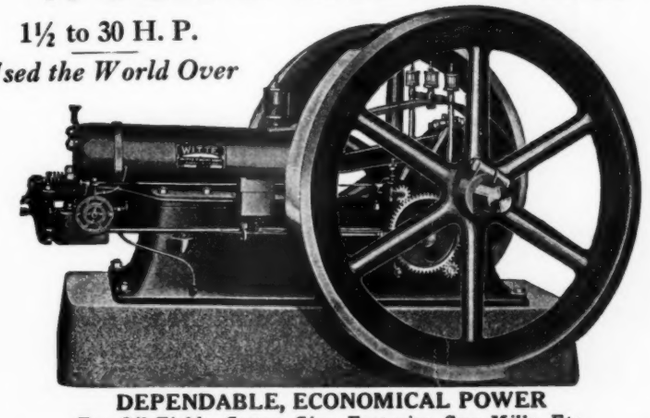

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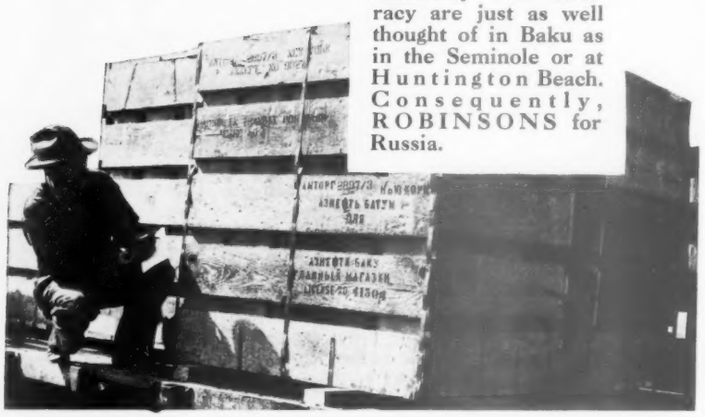

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RECEIPTS OF CALIFORNIA OILS AND IMPORTS DURING NOVEMBER

Receipts of California crude and refined oils at Atlantic and Gulf Coast ports for the month of November totaled 1,662,000 bbls., a daily average of 55,400 bbls., compared with 3,155,000 bbls., a daily average of 101,774 bbls. for the month of October.

Receipts at Atlantic and Gulf Coast ports for the week ended December 3 totaled 533,000 bbls., a daily average of 76,143 bbls., against 77,000 bbls., a daily average of 11,000 bbls. for the week ended November 26.

	Total		Week Ended	
At Atlantic Coast Ports—	November	October	Dec. 3	Nov. 26
Baltimore	283,000	649,000	.....	.....
Boston	85,000	135,000	.....	.....
New York	691,000	1,485,000	459,000	77,000
Philadelphia	455,000	438,000	74,000	.....
Others	148,000	446,000	.....	.....
Total	1,662,000	3,155,000	533,000	77,000
Daily average	55,400	101,774	76,143	11,000
At Gulf Coast Ports—(None).				
Total Atlantic & Gulf Coast ports	1,662,000	3,155,000	533,000	77,000
Daily average	55,400	101,774	76,143	11,000
Distribution of total California receipts is as follows:				
Crude	741,000	785,000	216,000	.....
Gasoline	633,000	1,139,000	224,000	77,000
Gas oil	148,000	311,000	93,000	.....
Fuel oil	140,000	862,000	.....	.....
Lubricants	.....	58,000	.....	.....
Total	1,662,000	3,155,000	533,000	77,000

According to figures collected by the American Petroleum Institute, imports of crude and refined oils at the principal ports for the month of November totaled 6,574,000 bbls., a daily average of 219,133 bbls., compared with 5,582,000 bbls., a daily average of 180,064 bbls. for the month of October.

Imports at the principal United States ports for the week ended December 3 totaled 1,530,000 bbls., a daily average of 218,571 bbls., compared with 1,606,000 bbls., a daily average of 229,428 bbls., for the week ended November 26.

	Total		Week Ended	
At Atlantic Coast Ports—	November	October	Dec. 3	Nov. 26
Baltimore	1,057,000	808,000	409,000	152,000
Boston	241,000	406,000	.....	.....
New York	2,536,000	2,460,000	609,000	832,000
Philadelphia	903,000	119,000	216,000	234,000
Others	812,000	1,057,000	156,000	165,000
Total	5,549,000	4,850,000	1,390,000	1,383,000
Daily average	184,967	156,451	198,571	197,571
At Gulf Coast Ports—				
Galveston district	120,000	50,000	.....	.....
New Orleans and Baton Rouge	795,000	599,000	140,000	163,000
Port Arthur and Sabine district	60,000	25,000	.....	*60,000
Tampa	50,000	58,000	.....	.....
Total	1,025,000	732,000	140,000	223,000
Daily average	34,167	23,613	20,000	31,857
At All United States Ports—				
Total	6,574,000	5,582,000	1,530,000	1,606,000
Daily average	219,133	180,064	218,571	229,428

*Revised.

Oil-Finding Devices Promise Revolution In Survey Methods

SHREVEPORT, La., Dec. 17.—North Louisiana is having a demonstration of the value of geophysical surveys to determine the location of dome formations offering possibilities of commercial oil and gas reservoirs. While to date the "highs" thus indicated have not been proven one way or the other by a drilling bit, the northeastern part of the state is attracting attention by a showing for a commercial gas well made by a wildcat 30 miles from nearest production. Another is rapidly nearing a level where a similar show or indications of the presence of oil should be obtained.

Eleven of the eighteen "highs" discovered in Louisiana during recent months were found by use of the torsion balance, seismograph and magnetometer and the seven others by closely regulated geological reconnaissance drilling.

In the latter category come the "highs" determined by Humble Oil & Refining Co.'s exploration along the Angelina-Caldwell flexure across middle Louisiana from Natchitoches Parish through Grant and Winn into LaSalle, with southeastern Winn Parish offering the most encouragement—so far as information released is concerned. Tunica Petroleum Co. did the same thing in Grant and LaSalle Parishes with the result that it chose the vicinity of White Sulphur, LaSalle Parish, 25 miles south of Urania Field, as the most likely locality and drilled a dozen wells of which five or six yielded production enough to warrant more thorough prospecting when conditions in the industry improve.

Many wells had been drilled in Richland Parish prior to the discovery well completed in November 1926, it is true, but a geophysical survey of that entire district was conducted before the Gulf Refining Co. leased its first large block and drilled the discovery well. Meanwhile, the new scientific devices had been employed successfully in the Gulf Coast territory. The company has acquired two more large blocks, giving it a total of between 14,000 and 20,000 acres, most of it now classed as proven. The company is drilling one well, No. 1 Millsaps, in Section 8-17-6, a few miles north of nearest production, upon which the attention of oil men is focused by reason of the fact that it is definitely on one of the highs revealed by the geophysical survey.

Six or eight such highs have been located by the seismograph and torsion balance in this territory on one of which, the Moody-Seagraves No. 2 McCoy in Section 30-16-6 Richland Parish, said to be Louisiana's largest gas well, was completed late last week and successfully closed in is located. It is believed from an incomplete gauge that it is making 70,000,000 to 75,000,000 feet.

But the wildcat attracting most attention is the Palmer Corp.'s No. 1 White in Section 2-19-10 West Carroll Parish. This is because, with a strong show of gas from 16 feet of sand at 2,450-66 feet, it is to be tested late this week and because it is on the north slope of a high worked out by seismograph for the Roxana Petroleum Corp. Should it prove a commercial gasser or an oil well the effect will be virtually to revolutionize the methods of conducting surveys preliminary to leasing for oil and gas exploration in this territory.

GEOLOGY OF COLORADO

Geology and natural resources of Colorado, by Russell D. George. Published by the University of Colorado, Boulder, Colo. Anyone interested in the geology and mineral resources of a particular state usually has to search through a mass of state and Federal reports, many of them out of print and only available in the larger libraries. Arkansas, Alabama and Arizona have recently compiled handbooks covering either the geology or mineral resources or both. The latest addition is Colorado, with a book of 228 pages, a resume of all the resources of Colorado, well illustrated by halftones and maps, including a colored geologic map of the State.

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ENGINES UNITS

DRILLING TO NEW DEEP HORIZON IN TRINITY GROUP, PINE ISLAND

By D. H. Bancroft

SHREVEPORT, La., Dec. 17.—Recent completions and wells now drilling in a new deep horizon of the Trinity group in Pine Island are affording operators in that area and geologists much information regarding the hitherto little known lower formations in the Trinity, as well as considerable production. The first well in this new 3,900-foot pay was completed by The Texas Company, No. 42 Caddo Mineral Lands in Section 23-21-25, December 6, 1926, making 75 bbls. initial, total depth 3,918 feet, but because this company, as well as others operating in Pine Island, were still getting good production from shallower wells, the discovery was not followed by very much drilling until the middle of the last summer when, with production declining, Haynes Brothers started a new campaign with completion of their No. 2 Murray in Section 14-21-15 which started off at the rate of 16,000 bbls. per day, but bridged, and when brought back made only 6,500 bbls. This well, however, was in the 3,600-foot horizon where, until a couple of weeks ago, most of the recent completions in Pine Island have been finished.

Third Producing Horizon

The new 3,900-foot stuff, the third producing horizon in the Trinity, which in turn is the fourth formation or group to yield oil or gas in the Pine Island district, is the first true sand found in this group. The first horizon in it, known as the Dillon sand, tapped by the Dixie Oil Co. with No. 43 Dillon in Section 13-21-15, is really a porous lime and yielded gas only, save for one well, Dixie's No. 1-A Noel, which yielded a little oil. The Dillon well was intended as a 5,000-foot test when it was begun, F. H. Wickett, president of the company, determining to make such a test when the older known horizons fell to small production. He has yet to carry out this plan as every time he has attempted it production has been found before he got very much lower than existing proven horizons. It blew in unexpectedly, with no casing in the hole, in October, 1924, wrecked the derrick and caught fire. Brought under control, it was cased and finished October 27 as a 45,000,000-foot gasser at around 1,200 pounds rock pressure and is still producing.

The gas being decidedly wet, the company next went back to No. 53 Dillon, a previous completion in the Woodbine sand at around 2,900 feet, which sand the Dixie also pioneered, and deepened it to 3,757 feet, casing off the gas found in No. 43, and finished it as a producer in the same porous lime in which the Haynes Brothers, The Texas Company's Herndon, Dixie's Files and Mabrym, Gulf Refining Co.'s Tyson wells and the Arkansas Fuel Oil Co.'s No. 1 Bashara, all in Section 14-21-15, have been completed since July 1. This formation lies about 90 feet and is characterized by Dr. T. F. Crider, geologist for the Dixie, who has devoted more time and study to the Pine Island Trinity group than almost any other in this territory, as a cavernous lime, which it is proposed to name the Wickett sand.

The lime itself is filled with sand and minute shells and, as indicated by Crider's designation, filled with crevices and cavities, and is referred to commonly as "oolites" or oolithic lime.

Two hundred and eighty feet below the first of the three producing horizons, the gas "sand" tapped by the Dixie's No. 43 Robertshaw, is the present 3,900-foot sand, a true quartz sand, the first found in the Trinity and yielding the deepest production in Pipe Island. It lies a few feet below the lower red shales and yields the first production found in this country under those shales, which heretofore have been regarded as a sign of no hope for production below. But now that production has been found Crider seems to think there is no reason why additional productive horizons should not be found still lower.

How thick this new sand may be is at this time unknown, but whatever it may be, it is doubtless a better horizon than either of the upper two as it carries no water, whereas the second, or cavernous lime, does, and the first is a gas sand. In the past two or three weeks that development of the new horizon has come to the fore, five producers, having an initial production of 2,500 bbls., have been completed, Dixie company's No. 89 Dillon being the best with 960 bbls. initial, while the others ranged from 200 bbls. to 500 bbls.

Drilling that has been done thus far has developed this deep production only in Section 14-21-15 with a few wells just over the line in Sections 15 and 23. The Dixie Oil Co.'s No. 10 Slattery, Section 27-21-15, the deepest in the vicinity, which went 4,121 feet and got salt water limiting production on the south, is believed to have been too far down on structure. Other failures on the north and west appear to limit expansion in that direction, leaving only the northeast, east and southeast as possible trends and in these the Palmer Corp. and Ohio Oil Co. are both drilling, the former in No. 1 Sellington, southeast in Section 17-21-14, now below 3,700 feet and the latter on No. 25 E. K. Smith, northeast in Section 21-21-15, which is drilling below 5,100 feet.

Cotton Valley Prospects

The only other locality in the Shreveport territory where deeper drilling has produced favorable results is in Cotton Valley, Webster Parish, 30 miles east of Pine Island, where wells completed at around 4,200 feet are producing a wet gas from the same horizon that is found in Pine Island at 2,900 feet. With the Trinity producing from three horizons in Pine Island it appears reasonable to expect the same results from the same formations in Cotton Valley, though it will require 5,000-foot drilling to get it and while such will probably follow it is not likely to be at any time in the immediate future; especially since, in the Bellevue district, midway between Pine Island and Cotton Valley, Humble Oil & Refining Co. has drilled to 4,500 feet without finding anything more than a slight show below the Bellevue pay.

USE OF COLORING MATTER IN GASOLINE INCREASING

Over the last year tremendous increases in the use of coloring matter in gasoline has been general throughout practically the entire country. At first the coloring of gasoline was pointed out as a mark of inferiority for it was said the refiner added the coloring matter to cover up the bad color of the gasoline. The adoption of colored gasoline as significant of its having antiknock properties is the later practice and the better performance of these antiknock gasolines has gradually led the public to accept colored gasoline.

Within the last two weeks the Pan American Petroleum has introduced a new green gasoline in California and shows the acceptance of the idea there even though antiknock gasolines are slower to be appreciated there due to the inherent high antiknock qualities of the gasoline made from the California crudes.

Just how far the practice of coloring gasoline will extend and what reaction may come about eventually is problematical. It is pointed out that if the public finds that colored gasoline is a better fuel in those cases where a premium is charged, they will continue to accept it as significant of quality and if the public may be educated to accept colored gasolines it will permit a great savings in the refining industry and allow a better average gasoline to be placed upon the market. This will be brought about by refiners modifying their treating methods to conserve the less stable constituents of the gasoline which discolor the gasoline but in turn give the gasoline added antiknock value.

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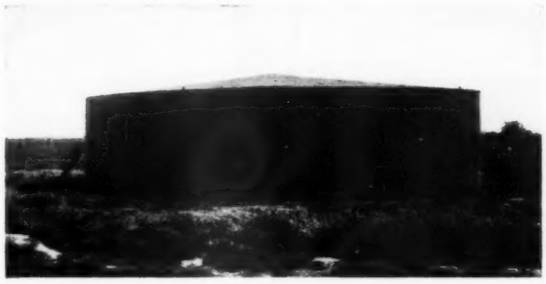

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Water Treatment at Gasoline Plants

Each Source of Supply Presents New Problem. Effect on Equipment Varies. Explain Use of Chemicals

By F. B. Good*
Chemist, The Texas Company.

The most efficient and economical type of water treatment for engine cooling at natural gasoline plants is dependent upon the characteristics of the water, and the amount of water available and its cost. Some of the waters of the Southwest are so high in total solids and scale-forming matter that it is impractical and uneconomical to attempt treatment by chemical means. When a water of this character is encountered, a new supply should be located, or a closed water circulating system installed.

Zeolite is effective, where water has little or no salt in solution, but the high salt contents of the most of our waters in the oil producing territory makes this type of a treater impractical. Barium hydrate is another efficient treatment, the barium acting upon the sulphate of lime forming from it caustic lime and barium sulphate. The caustic lime in turn throws down the carbonate of "temporary hardness"; whereas by the addition of one chemical we remove both the temporary and permanent hardness, which seems to have the advantage over even the lime, soda ash treatment, as it eliminates the chances of your boiler foaming, from a concentration of sodium sulphate, where the turbidity is high, we should revert to the lime soda ash treatment, a treater of this type can be built for about $30 which is capable of handling 10,000 gallons of water a day.

Apparatus

The apparatus consists of two tanks, one 3 by 3 by 4, the other 4 by 4 by 12. The smaller is used for mixing the lime and soda ash in solution, it has a perforated tray extending within 8 inches from the top. A jet of water is directed upward against the bottom of this tray, this dissolving the chemical, which in turn flows into the effluent tank. The second tank, which has the following size, 4 by 4 by 12 feet, is divided into four compartments, by partitions each compartment having the size of 2 by 4 by 6.

The first compartment of this tank has a series of baffles for the intimate mixing of the chemical and water, these baffles are set upon a tray extending down 1 foot from the top of the tank. From compartment one, the water flows into settling basin through pipe in bottom of tray, here it has the entire length of the tank to settle out before entering compartment three or filter. This filter is composed of rock, gravel and sand; rock 6 inches, graves 6 inches and 1 foot of sand, from compartment three it enters from the bottom into compartment four, the fully treated water, ready for the hot well or over your entire engine jackets.

Scale and Effect

Scale which is formed in boilers vary from one-sixty-fourth inch in thickness to 2 or 3 inches thick. These scales also vary in appearance, some being light and very porous, others, which are formed by water having a high and sulphate content, very hard and difficult or removal, especially if there is very much silica in the water. The heat transfer on the shell and flues of a horizontal return tubular boiler or in the water tubes and drums of water tube boilers, is very much retarded, as this scale acts as an insulating material.

Various estimates have been made regarding the loss, some out of all proportions, some go as high as 75 per cent loss, several reputable engineers met and agreed that it could be safely said that one would save in fuel and boiler efficiency alone 13 per cent for every pound of scale forming matter removed from the water, and I think this a very conservative estimate.

Gas Engines

Scale forming water is also a serious matter for operators of internal combustion engines, whether gas, gasoline or oil, as the heat produced by explosion within the cylinder is transferred to the engine cooling water in the head and jacket and if a layer of scale forms on the metal walls of the cylinder, the heat transfer is reduced. This results in an increase of lubricating oil, higher exhaust temperature in the combustion space and manifolds and frequent breakage of gas engine heads, cracked pistons and rings. For an illustration: There is one company that operates more than 200 gas engines in compressor service in this field and they have demonstrated that they can obtain as high as 18,000 horsepower hours per gallon of oil with clean engines against 8,000 horsepower hour, with engines which are badly scaled.

Another source of trouble with water in the operation of internal combustion engines, is due to corrosion which takes place in the water lines, lines of power cylinders and exhaust manifolds. This corrosion is usually due to dissolved oxygen, free carbonic acid, magnesium chloride or calcium chloride in combination with magnesium sulphate. Many engines are run in what is termed wet condition, that is, a small amount of water is injected into the cylinders at the time of the explosion. The purpose of this water is to insure a perfect combustion, but if the gas used contains an appreciable amount of sulphur compounds, we will find that the water combines with the oxidation of sulphur under proper pressure and temperature conditions to form sulphuric acid, which breaks the film of lubrication and causes pitting of the engine cylinder.

Methods of Elimination

These devices are known as "deaerators" and operate on the principle of heating water under a vacuum, which causes the dissolved gases to be removed. Companies using these devices claim that they are successful and that they do remove dissolved oxygen and free carbonic acid, which have proved most objectionable by causing pitting of tubes and steam lines.

Carbonic acid can also be removed with a spray system which aerates the water. Another mechanical device which is coming into considerable use is a mechanical steam separator installed either internally or outside the boiler, which has for its purpose the removal of small droplets of water, mineral matter and other impurities which ordinarily are carried out of the boiler by the stream of steam.

Compounds

Next to the external softening of water comes the internal treatment. Just as a man suffering from indigestion will run to the drug store and buy a bottle of patent medicine, so will the operator of an isolated plant who is having scale trouble. These compounds for internal treatment are ordinary combinations of sodium salts and tannic acid, silicate of soda fortified with caustic, soda ash or trisodium phosphate, organic material such as starches, gums and extracts in combinations with sodas, which have for their purpose the converting of crystalline scale forming matter into a colloidal state.

Methods of Scale Form

Calcium carbonate: To test for calcium carbonate, pour water to be treated into ordinary water glass, add a little ammonia, then a little ammonium oxalate; heat to a boiling point, if calcium carbonate is present a white precipitate will form.

Calcium sulphate: To test for calcium sulphate, pour water into a glass, add a few drops of hydrochloric acid (muratic acid) and a small amount of barium chloride, heat slowly; if a white precipitate is formed which will not redissolve when nitric acid is added, calcium sulphate is present.

Organic matter: To test for organic matter, add a few drops of sulphuric acid to a glass of water, to this add enough potassium permanganate solution to cause a permanent faint rose color. If this solution retains its color after standing a few hours no organic matter is present.

Corrosion test: To test for corrosion, take a few drops of methyl-orange. If the sample is corrosive, upon the addition of a few drops of methyl-orange water will have a pink coloration (salmon red). If harmless and not corrosive, it will be yellow.

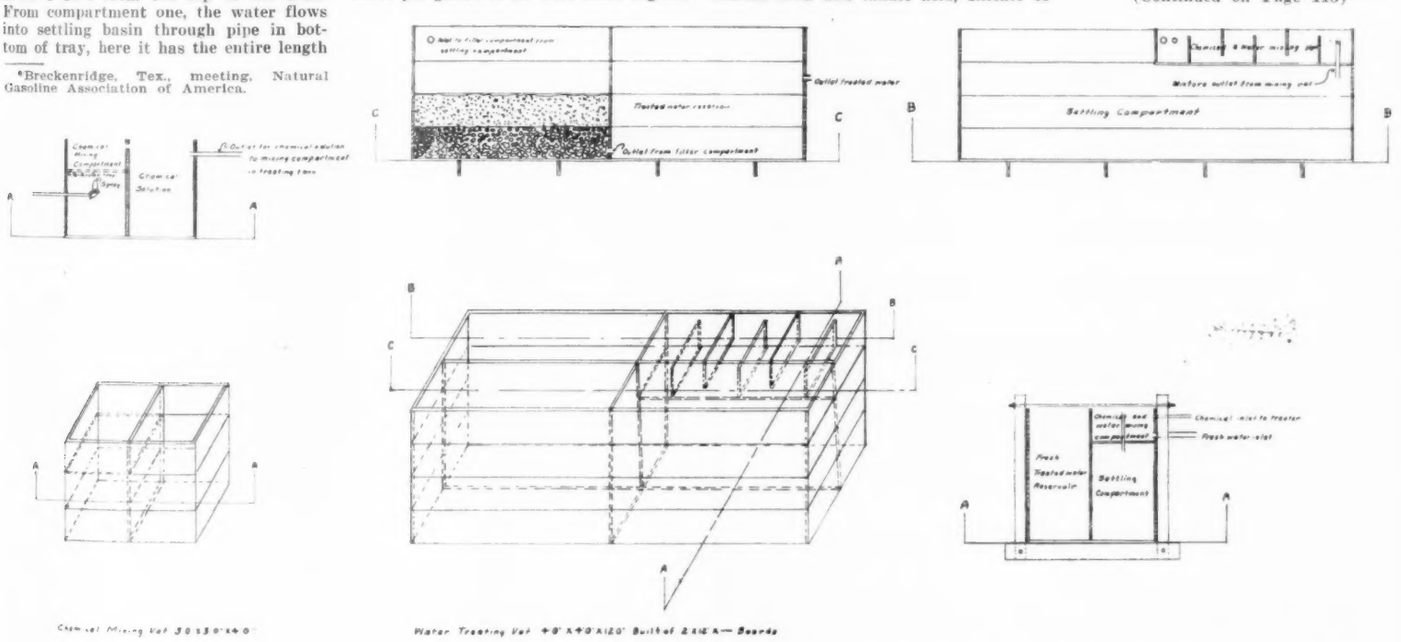
Mechanical suspension: To test for mechanical suspension, stand glass of water in a quiet place for 24 hours. If no sediment is formed in the bottom of the glass, there is no mechanical suspension.

Calculation

Suppose that a water has an alkalinity of 73 parts per million and the operator desires to reduce this to 60 parts per million hour much lime will be required to accomplish, by test there has not been found any free carbonic acid or monocarbonate alkalinity. While it is not possible to learn from the alkalinity test how much of it is composed of magnesium carbonate or sodium carbonate,

(Continued on Page 113)

*Breckenridge, Tex., meeting, Natural Gasoline Association of America.



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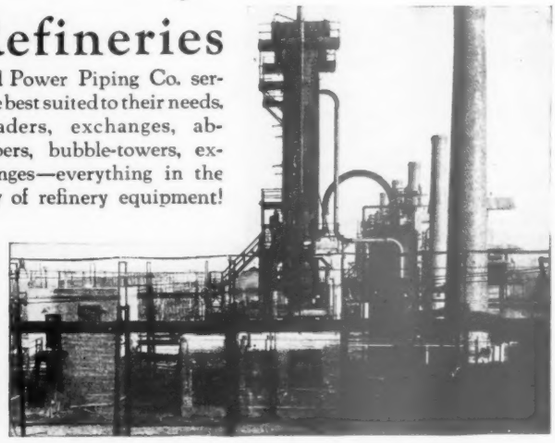

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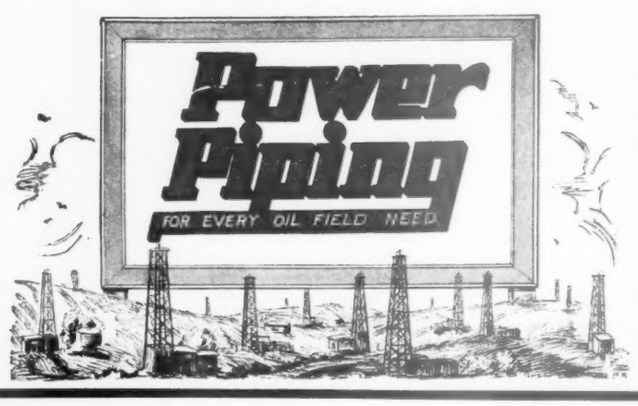


PIPE LINE CORROSION PRESENTS BIG PROBLEM

(Continued from Page 64)

sidered as a permanent protection. Such paints dry by evaporation or oxidation, resulting in either case in pinholes and hairline cracks in the film. These openings allow the corrosive agents to reach the metal, with the result that corrosion spreads under the coating and eventually pushes it off. Corrosion is consequently concentrated at these points of weakness, and more pitting probably results than if no coating were applied. Field tests of such materials usually show poor results and indicate their unsuitability for permanent work. It is being recognized generally that, for permanent work underground, it will be necessary to adopt some material applied hot.

Wrapped and Unwrapped Coatings

In attempting to build up a substantial thickness, the writer believes that better results will be obtained if the thickness is secured with one application of a hot bituminous material, rather than with several applications alternating with a wrapping material. In the first case a thick homogeneous coating of one material results, and only one application besides the priming coat is required. Wrapped coatings require from three to five applications, and careful field work and rigid inspection are necessary to prevent wrinkles, folds and sags. Various methods of cutting the wrapping material and applying it have been developed, and better work is being done now than formerly. It is not practicable to wrap the couplings on a gas line, but this drawback has been overcome by placing a paper or fabric form around the coupling, and filling it completely with the protective composition. This method is expensive and not very satisfactory, because leaks are hard to repair. Wrapped coatings are more expensive than unwrapped ones, especially if more than one ply is used. As it is possible to make a single application of a satisfactory hot coating with a thickness of approximately one-sixteenth of an inch, it is doubtful whether wrapping is necessary to fulfill the requirement of thickness.

Asphalt and Coal Tar Pitch

There are a great number of different compositions offered today for protective purposes. Experience has indicated, however, that bituminous compounds, which include asphalt and coal tar materials as a base, are the important ones. Each of these basic materials has its advocates, therefore, a discussion of their advantages and disadvantages may prove of value. The asphalt compounds used in the past for the underground coatings have not given consistent and reliable results. In some cases results seem to be satisfactory, while in other cases the material seems to have disintegrated and lost its protective value. Sometimes these contradictory results have taken place under conditions that seemed to be identical. Apparently leeching occurred, leaving a hard, brittle material. This eventually becomes cracked, usually with only fine hairline cracks, but sufficient to allow moisture to reach the pipe. With wrapped coatings the same thing has occurred with the outer coating of asphalt. Moisture then reaches the wrapping, eventually softens it, and causes it to sag away from the bottom of the pipe. This results in a pocket containing water and causes extensive pitting. Hundreds of miles of pipe line coated in this way, which from a superficial examination were considered to be in good condition, were later found to be badly pitted along the bottom of the pipe. A coal tar pitch base compound is being recognized today as a superior material for underground protection against corrosion. It meets all of the requirements mentioned above for the ideal pipe coating, if the choice of the raw materials entering into its manufacture is based on sufficient experience, and knowledge of the physical characteristics of the various pitches, and their reaction in combination with the other material involved in the manufacture of the coating. Most coal tar pitches, however, have a very narrow plastic temperature range, and are unsuitable in many cases for use underground, if the variation in ground temperature exceeds the temperature limitation of the material. It is possible though to compound a protective composition of an all-coal tar pitch base that is not subject to this narrow temperature range. It should be borne in mind that there are literally hundreds of coal tars and coal tar pitches, with widely different physical as well as chemical characteristics. Some are absolutely of no value, while others only fulfill some of the requirements of a good coating. The same is true of asphalts. Most of such compositions are simply by-products and are worthless for the purpose of permanent underground protection. Therefore, the fact that a material is designated only as being of a coal tar base, with nothing available in the nature of a performance record, does not mean anything. An enthusiastic coal tar advocate will find many good asphalt products far superior to some poor coal tar compositions and vice versa.

Values of Tests

Many cheap bituminous compositions change chemically with age. This is one reason why laboratory accelerated tests are not conclusive. Unfortunately there is no test that can be made beforehand to indicate whether chemical changes will occur or not. Laboratory or accelerated tests simply tell the quality of a material at the time the test is made, but nothing definite can be done in this way to indicate what the material will be like in say 10 or 15 years. Compositions that pass the tests may later prove unsatisfactory on account of subsequent deterioration. Such tests have a value, it is true, as they will undoubtedly eliminate coatings of little merit. There is always a doubt that possibly any one of the survivors of such a test might have failed if the test had been run a little longer. There is a test, however, and only one, that has conclusive value. This is a real service test on a pipe line in the field, preferably in the worst soil conditions. Some companies have a "graveyard" for testing. Cinders, salt, sulphur, manure and similar well-known corrosive agents are mixed with the soil. Coated pipe is buried in this wet mixture. To some extent this is an eccelerated test, but not of the severity of most laboratory tests. It will be found that the life of coatings in actual service will follow very closely the results predicted by such a test. It consequently has a real value.

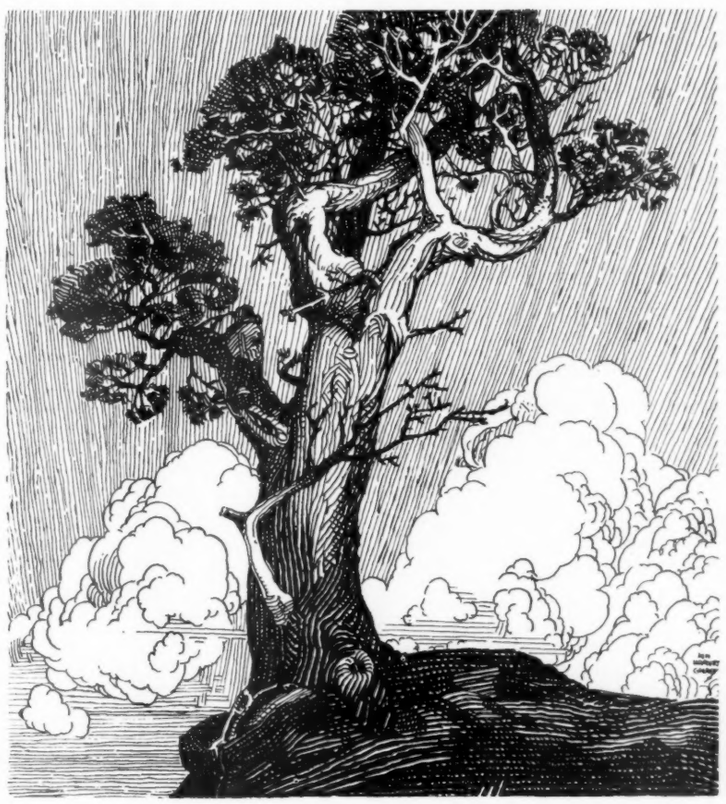
Requirements for Application

The principal requirements for application of a coating are that the pipe surface must be absolutely clean and dry. All dirt, dust, loose mill scale, rust, grease or oil must be removed before any protective composition is applied. This is absolutely imperative and essential, and applies not only to the main pipe surface, but in the case of a coupled gas line, to the center rings, follower rings, bolts, and nuts of the couplings. Old pipe must have all of the rust thoroughly removed, especially from the pit holes. Even new pipe will accumulate a coating of light rust, and should be cleaned especially to remove the mill scale. All welds should be carefully cleaned of loose welding scale. The best way to clean a pipe line, new or old, is by means of a portable pipe-cleaning machine.

The requirement that the pipe be dry is just as important as the one that it be clean. It is evident, therefore, that weather and field conditions have considerable bearing on the application. If great speed is necessary in the construction of a pipe line, but weather and field conditions are not conducive to a satisfactory application, a decision will have to be made, whether to wait and secure a good job or accept an inferior grade of protection.

There is a growing tendency, fortunately, on the part of pipe line men, to recognize that a satisfactory job of pipe coating consists of two main factors—proper material for the purpose, and also proper application. Money spent for the best pipe coating in the world might just as well be thrown in the ditch, if the application is not carefully and properly

The LANDMARK



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made. Some officials absolutely prohibit the application of any protective coating if the pipe is wet or frosted, realizing that no coating can be expected to adhere under these conditions. Instead of proceeding under such unfavorable conditions, the line is sometimes placed in service but kept above ground. One priming coat should be applied for temporary protection. Later, when field or weather conditions have improved so that proper application can be made, the line is coated and buried. This seems a desirable practice, when possible, and one that should be in more general use. The extra expense will be far less than the cost of reconditioning later.

The suggestion has been made, and adopted in some cases, to have the pipe coated at the mill with a preliminary priming coat. There are several decided advantages to this procedure. In the first place, the coating can be applied under much better conditions than are usually possible in the field. The second advantage is the protection against atmospheric corrosion during transit and storage. Field cleaning is, therefore, considerably reduced, which speeds up the work, cuts down the cost, and a better job is likely to result. The same requirements for application are necessary at the mill as in the field. Furthermore, it would be extremely desirable to coat the pipe while it was warm. The extra cost of this preliminary coating is slight and either wholly, or to a large extent, offset by the reduction in field costs of cleaning. This preliminary application will not be of much value as a priming coat after the pipe is laid, and should be followed by the customary first coat of priming solution before a thick coating is applied.

Costs

The cost of any protective coating must be such that the expected protection or increased life of the pipe will more than justify its use. For permanent lines it is justifiable to spend more money than for temporary ones. Conversely, it is not economic to purchase a high-priced material intended for permanent work if the line is only to be in service for a short time.

In general, costs will be about as follows:

For paint applied cold—1 to 3 per cent of the total cost of the line.

For thick unwrapped coatings applied hot—5 to 9 per cent of the total cost of the line.

For wrapped coatings—10 to 15 per cent of the total cost of the line.

Pumping stations or compressor stations are not included in the total cost of the line. The variation in cost is due principally to dissimilarity in location, topography, field and weather conditions, and also whether the owner, general contractor or coating manufacturer makes the application. As a rule, it will cost more if the coating manufacturer does the work, for the reason that he supplies a separate organization, which necessitates a duplication of trucks, camps, and commissaries. He must also regulate the speed of application to conform with both the laying and ditching. This often necessitates delays or disorganization in his schedule of operations, with a resulting increase in cost. The owner or general contractor can maintain a much better schedule by shifting labor from one operation to another.

Conclusion

When it is realized that the cost of reconditioning a line is usually about three times the cost of applying a satisfactory protective coating, it seems desirable to adopt a policy of coating all new lines, whether the soil conditions are known to be corrosive or whether this is unknown. Eventually all lines not properly protected may be expected to fail from corrosion and from nothing else. Due to the lack of complete knowledge regarding the complex problem of soil corrosion, and the impossibility of even approximately predicting the life of an unprotected line, a good protective coating provides reasonable insurance against the destruction of large investments in permanent underground pipe lines.

OUACHITA NATURAL CO. MAKES BIG ACQUISITION

(Continued from Page 56)

chase giving the first hint as to what was about to happen.

From White City, or Cullendale as it has been named since the Southern International Paper Co. chose the outskirts of Camden as the site for a new pulp mill, to Pine Bluff isn't so far as pipe line projects go these days. Arkansas Natural Gas Co. has a lateral from its Caddo-Little Rock 16-inch line into Pine Bluff. Arkansas Natural and Empire Gas & Fuel Co., it is persistently reported, have got together on a deal of some sort. Empire Gas & Fuel Co. has a line from the Clarksville (northwest Arkansas) gas field to Morrilton, 40 miles west of Little Rock, and Little Rock is only 144 miles from Memphis. A pipe line from the Richland and Monroe gas fields to St. Louis is a certainty though who will build it is not—at this time—and it will be built on a survey about half way between Little Rock and Memphis. Possibilities are obvious and the probabilities are great.

Formal announcement of the Hunter-Morgan trade which will result in completion of the Monroe-Camden line was couched in the following:

"The Ouachita Natural Gas Co., of Monroe, La., owned principally by S. D. Hunter of Shreveport and the estate of S. S. Hunter, has bought all the assets of the El Dorado Gas Co. and the Central States Gas & Electric Co., and all the interests of Hamp Wade and S. R. Morgan in the Louisiana-Arkansas Pipe Line Co. for $1,350,000 making the Louisiana-Arkansas Pipe Line Co. also 100 per cent owned by the Ouachita Natural Gas Co. and other Hunter interests. The sale was consummated and recorded Thursday, December 8 and the receivership of the El Dorado Gas Co. has been dismissed.

"The gas reserves held by the Hunter interests consist of 22,000 acres of proven territory in Ouachita and Morehouse Parishes of the Monroe Field and 6,000 acres of proven territory in the new Richland Parish Field with leases on an additional 35,000 acres close to proven stuff and in trend of production. Available production held by the Hunter interests amounts to approximately 350,000,000 feet, open flow.

Dixie-Gulf Pipe Line Co., the Moody-Seagraves gas interests' carrier from Webster and Caddo Parishes (Louisiana) and Waskom (Harrison County, Texas) gas fields to Houston and Port Arthur has about completed construction of its 22-inch Dresser line, B. A. Hardey, vice president of the Greenwood Production Co., producing end of the enterprise, said. In fact, line tests are under way and deliveries to customers in the two terminals and in intervening towns along the main line and on short laterals all the way through East Texas are expected by January 1. Dixie Gas & Utilities Co. will be the distributing agency in all communities served.

Confirmation of rumors that the Palmer Corp. will be the major figure in the proposed Richland Parish-St. Louis 24-inch gas line, although lacking because of the absence of N. C. McGowen, vice president, from the city and the probability that he will not talk at this time, are backed up by the corporation's acquisition this week of the gas rights on all the Gulf Refining Co.'s several thousand acres of the choicest stuff in the Richland gas field. The tendency here is to accept these rumors as, if not fact, at least having more the semblance of fact than fancy.

Oil pipe line activities contributed their bit to pipe line news developing during the week. One case savers more of production than of pipe line news in as much as it shows the extent to which North Louisiana and Arkansas crude oil output has declined. It is embodied in the fact that the Texas Pipe Line Co. has shut down three of its pumping stations on the main line from Smackover, Caddo, and intervening fields, to Port Arthur, those at St. Augustine, Bunker Hill and Jasper, Tex., the station at

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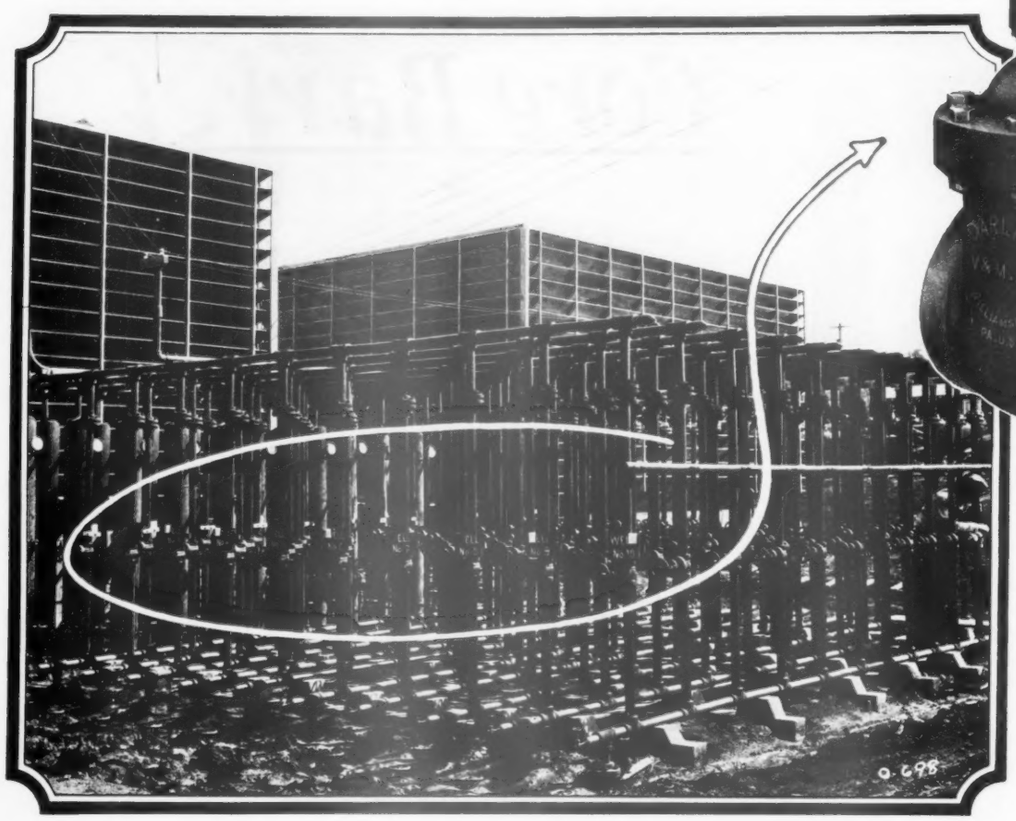

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DARLING TRADE MARK

DARLING GATE VALVES

DARLING TRADE MARK

Logansport now pumping to Port Arthur, a distance of 143 miles. Shipments during November amounted to 418,000 bbls.

Inquiry for a pipe line map showing all principal pumping stations and booster stations in Arkansas, Louisiana and East Texas led to information that the Standard Pipe Line Co. has installed electric power in its booster stations at Wilton and Fouke, Ark. The former is halfway between the DeQueen and Mandeville, Ark., stations and the latter halfway between Mandeville and Ida, La., stations. The installations consist of centrifugal pumps direct connected to motors and is claimed to have increased capacity of the line on which they are installed (one of five lines comprising the Oklahoma-Baton Rouge line in this section) about 10 per cent, the lines now having a capacity of 85,000 to 90,000 bbls. per day. Power is supplied by the Southwestern Gas & Electric Co., high tension transmission system serving southwest Arkansas, Caddo Parish, Louisiana, and a number of northeast Texas towns in which the company's new Arsenal Hill plant at Shreveport, the Texas Light & Power Co. plant at Marshall, Texas, and the Southwestern Gas & Electric Co. plant at Texarkana are interconnected. East Texaxs Light & Power Co., an Insull property, acquired the Southwestern Gas & Electric Co., operating in Texarkana, Shreveport and Beaumont, a few months ago from the Dawes interests and is operating as the Southwestern Gas & Electric Co.

CENTRAL WEST

(Continued from Page 50)

farm, Section 15-14-7. Trenton was reached at 910 feet.

Vigo County—Operations on the Therman McDonald well, Section 35, Linton Township, northeast of Farmersburg, have been resumed after several weeks of inactivity. This well is now down 2,180 feet. A showing of oil was reported at 2,135 feet.

Mr. Kingsbury says in his report that during October Indiana produced 75,000 bbls. of oil, of which 66,000 bbls. came from wells in the southwest part of the State, and 9,000 bbls. from the old Trenton Field in the northeastern part of Indiana. September production for the State was 74,000 bbls., of which the southwestern part produced 64,000 bbls. and the northeastern part 10,000 bbls. The State's production for the 10 months period—January to October, inclusive—during 1927 was 706,000 bbls., compared to 673,000 bbls. during 1926.

Logs of all wells drilled in Indiana should be sent to Mr. Kingsbury's office following completion of the wells. This is required by a regulation of the Department of Conservation. At this season every possible means should be employed to prevent waste of gas. Reports to his office of all leaking gas lines and wells will be appreciated.

Illinois

Quietude prevails in all sections of Illinois and the week's report shows but two completions. In Dennison Township, Lawrence County, the Ohio Oil Co. brought in a 25-bbl. pumper at its No. 20 well, 660 feet from the south line and 175 from the east line of the Laura J. Jenner 141 acres, Section 36. In this well the Kirkwood sand was found from 1,540 to 1,617 feet; the Tracy sand at from 1,662 to 1,679 feet and the McCloskey sand from 1,800 to 1,805 feet, the well being shot with 140 quarts. These are the three lower sands in the Bridgeport Field and all have proven very productive since work first started, although there are more shallow sands that have produced for years, the Bridgeport, Ridgley, Buchanan, Green and others. More pay sands are found in the Bridgeport Field than in any other known field east of the Mississippi River, and they are more like the California fields.

The Ohio Oil Co. pulled out and abandoned old No. 9 on the Laura J. Jenner, Section 36, Dennison Township.

In Montgomery Township, Crawford County, L. C. McDowell and others' No. 10 well, 625 feet from the north line and 600 from the west line of the J. F. Higgins farm, in the southwest quarter of Section 21, pumped an initial of 4 bbls. from a depth of 981 feet.

Central Ohio

Only two completions were reported from Central Ohio Field, as little work could be done on account of high water, snow and colder weather. In Killbuck Township, Holmes County, the East Ohio Gas Co.'s test on the J. W. Moore lease, Lot 13, is reported dry in the Clinton lime formation. The same company is credited with another at a test in the northwest corner of the D. and M. Mohler four acres, Lot 4, Monroe Township, Coshocton County.

A well-known Central Ohio oil and gas operator reports some of his findings through the eastern half of the Buckeye State: "Ohio Fuel Gas Co. is drilling a deep test on the Riley Harding lease, Section 9, Brookfie'd Township, Noble County, said to be close around a depth of 5,000 feet. Same company is drilling No. 1 on the E. W. White lease, Section 34, Richhill Township, Muskingum County. The Logan Gas Co. is reported around 4,000 feet at a test on the A. M. Blair lease, Lot 25, Washington Township, Tuscarawas County. Glass & McKinley are drilling a test at close around 3,500 feet on the C. C. Coventry lease, Lot 17, Goshen Township, same county. Federal Oil & Gas Co. is reported around 3,400 feet at a well on the Begaele Easiletti lease, Lot 2, Warrick Township, same county. In York Township, same county, Phillips and others are drilling a test on the Frank Decker lease Section 4. In Enoch Township, Noble County, a test is drilling on the Andrew Hill lease, Section 6. Low Gap Oil Co. is drilling a well or getting ready to spud on the John H. Merry lease, Section 33, same township. Harriettsville Oil & Gas Co. drilled in a 250,000-foot gas well on the West & G. Taylor farm, Section 29, Enoch Township. In Elk Township, Noble County, the Bloom Ridge Oil Co. is drilling a series of wildcats. This company's No. 1 on the N. F. Stout farm, Section 33, is a 2-bbl. pumper from the Buel Run sand. Stoffel and others are starting a well on the Luther E. Stoffell farm, Section 17, same township.

Michigan

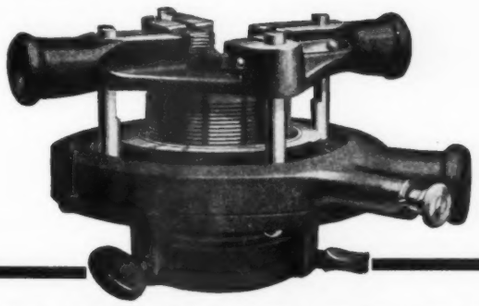
There is a little excitement in and around the well-known lake city of St. Clair over the discovery of natural gas in commercial quantity in the Niagara limestone formation at a depth of 2,768 feet, which may mean the opening of something valuable and may lead by further development work to the finding of an oil pool, as the Niagara lime is producing oil in parts of Illinois, in the vicinity of Martinsville, in Clark County, also in Central Ohio, in Guernsey County, as well as across the St. Clair River in Ontario, Canada.

The new well was drilled by the Diamond Salt Co. on its own property at St. Clair, south of Port Huron and along the St. Clair River, and is estimated at 1,100,000 feet. The gas will be utilized for both light and fuel at the plant.

E. M. Miller, drilling a test on the O. K. Bailey farm, north of Chesaning, Swan Creek Township, in the southwestern part of Saginaw County, found a light showing of oil in the Saginaw sand at a depth of 2,473 feet and gave it a shot of 100 quarts. It will require tubing before production can be had and until that is done or the bailer worked, nothing can be told of the value of the well.

The outcome of the test of the Pure Oil Co. on the J. B. Raynor land, in Greendale Township, Midland County, some over 20 miles northwest from the Saginaw Field, is being watched. In this well the Berea sand was found at 2,390 feet and it also passed through the Saginaw sand where a small showing of oil was found and is now going down to the Dundee. Late reports is that the depth so far is close around 3,100 feet. Expectations are that it will require at least 300 or 400 more feet to reach the Dundee.

William M. Bradley & Son are starting a test on the Fred M. Potter land, Section 20, Alpena Township, Alpena County.



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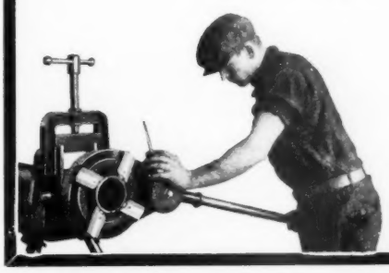

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STEEL PRODUCTION AT UNIFORM PACE WITH VERY PROMISING OUTLOOK

By B. E. V. Luty

PITTSBURGH, Pa., Dec. 19. — The steel trade is having a steady finish at the year-end, which makes a very promising outlook for the early part of the new year. While for several months there has been such complaint about the state of business as would suggest a decided decrease in demand, the production of steel, which is an absolutely trustworthy index, has continued at a uniform pace. There was no autumn increase as had been predicted and thus far there has been no tapering off. A decrease just around holiday time would not be significant. Last year production declined successively in November and December, yet the following March made a new high record for all time in steel production. The steady pace lately pursued makes it all the more certain that precedent will be followed, by steel production increasing decidedly during the first three or four months of the new year.

Nominally or technically production of steel underwent a decrease in November, by the official report of steel ingot production showing 5.7 per cent decrease from October, alike in the month's total and in the apparent daily rate, there being 26 working days in each month according to the calendar. Thanksgiving Day is not a "steel mill holiday," but that is technical. There is hand to mouth buying, only for necessities, and production accords with consumption. There was practically no consumption on the holiday. So, to all intents and purposes steel demand continued in November at the very uniform rate shown by production in the four preceding months, since July 1. There were changes in details, rail production increasing while some other lines fell off. There may even have been, for the month, an increase in production of tubular goods, by reason of the large line pipe orders taken by the two largest producers, and which are now giving them a heavier operation than in October.

Rail Buying Movement

About 750,000 tons of rails were booked in October and 650,000 tons in November, with orders thus far this month of over 100,000 tons and more business to be closed in the next few weeks, up to say a quarter million tons. This is the regular annual rail buying movement and while deliveries are nominally for the first six months of the new year there have been advance specifications on some orders, whereby rail mills have been able to increase operations.

In view of this rail business, with heavy bookings and light shipments, the Steel Corp.'s statements of unfilled obligations made a poor showing for each of the past two months. The increases of 142,927 tons in October and 113,404 tons in November were much less than would be accounted for by rails. Thus in products other than rails the bookings in the two months fell considerably short of the shipments.

Advances in Sheets

A month or so ago, when the advances in sheet prices of last May had been lost, the sheet mills had an ambition to advance prices again. At intervals three independents did announce price advances, but the move did not take well and last week the American Sheet & Tin Plate Co. (Steel Corp.) announced advances, there being chances that an announcement by this interest would be more impressive. The market has been 2.75 to 2.80 cents on black and 3.60 to 3.65 cents on galvanized, the advanced prices named being 2.90 cents on black and 3.75 on galvanized. Meanwhile, however, the mills are selling a good bit for first quarter at old prices.

A development that may prove of great importance is the announcement by the Bethlehem Steel Co. of prices on bars, shapes and plates f.o.b. its works at Buffalo, Bethlehem, Coatesville and Baltimore. Hitherto the "eastern market" has been based more or less on Pittsburgh, but with much shading. The new system may make a stable market in the East, and the Pittsburgh market would look better as it would be relieved of a bad sentimental influence.

Prices are perfectly steady on standard pipe and oil country goods.

EASTERN FIELDS

(Continued from Page 54)

The location is 2,000 feet west of the same company's test on the A. G. Plybon farm. In Union district, Ritchie County, S. W. Young has the rig completed for another test on the John Townsend farm.

Starting New Work

In Jefferson district, Lincoln County, Pridemore & Adkins have started to drill on the E. C. Stone farm. In Union district, G. T. Ray & Son are moving a drilling machine to a location on the Mathias Stowerd farm. The same parties have started to drill No. 3 on the James Cooper farm. In Barboursville district, Cabell County, Wilson & Nowery have started to drill on the Meadows-Harris farm. In Grant district the Harshbarger Oil & Gas Co. is rigging up on the Addison Connor farm. In Carroll district, Lincoln County, the Columbis Gas & Electric Co. has made a location on the C. C. Roberts farm. In the same district, the Cambridge Gas Co. has started to drill on the B. F. Hoskinson farm.

In Union district, Ritchie County, S. W. Young is due in the Maxon sand at a test on the William McCloy farm. In the same district, the same company is due in the Big Injun sand on the Lakin Pritchard farm. In Murphy district, the Hope Construction & Refining Co. has the rig completed for a second test on the W. W. Lawrence farm. In Grant district, the Junior Oil Co. is drilling in the sand on the Hickman heirs' farm. In the same district, J. G. Charyer has started to drill on the S. Tennant farm. In Union district, Clay County, D. H. Stephenson and others are drilling a second test on the Otto Bowman farm.

In Church district, Wetzel County, the Manufacturers Light & Heat Co. is rigging up at a test on the E. E. and Rachel Roberts farm. In Liberty district, Marshall County, the same company is building the rig for a second test on the M. J. Downey farm. In Pawpaw district, Marion County, Victor Tennant is due in the Big Injun sand at a test on the Jesse Brooke farm. In the same district, the Carnegie Natural Gas Co.'s test on the James Eddy farm and the Owens Bottle & Machine Co. are due in the same formation on the William Valentine farm. In Fairview district, the Mark-Bell Oil & Gas Co. is drilling at 1,500 feet on the W. S. Prickett.

In Murphy district, Ritchie County, L. W. Cunningham and others are placing rig material at a location on the G. W. Haines farm. In Cove district, Doddridge County, Ira D. Cox is rigging up on the Levi Spurgeon farm. In Troy district, Gilmer County, the Carnegie Natural Gas Co. has rig material at a location on the Charles Despard farm. In Freemans Creek district, Lewis County, the Moran Drilling Co. is building a rig on the Mary Griggs farm. In Washington district, Jackson County, E. L. Behm & Co. have shut down for casing on the Pearl Burch farm.

Southwest Pennsylvania

In the Cliff Mines district Finley Township, Allegheny County, Guyser & Co. have completed in the fourth sand a test on the Guyser-Cook farm and is good for 500,000 feet.

In Gilmore Township, Greene County, the Peoples Natural Gas Co.'s test on the N. H. Taylor farm is a gasser in the Gordon sand. In Morris Township, Sutton, Mong & Co. have drilled deeper a test on the Hettie Sprouls farm. It is a gasser in the same formation. In Springhill Township John Moorhead & Co. have drilled down their test and it is a gasser in the Gordon sand.

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SECRETARY'S POWER UPHELD IN OIL LEASE

By Charles E. Kern

Washington Bureau, The Oil and Gas Journal

WASHINGTON, D. C., Dec. 19.—The Secretary of the Interior is upheld by the Court of Appeals of the District of Columbia in his right to disregard rules of the Interior Department in determining title to land and in the exercise of such duty he may take over a case from his subordinates in the land office and render his decision.

Suit was brought to determine whether the title to public lands passed to the State of California, the mineral character of the lands being controverted. When the question of the mineral character was raised a stipulation was made by the parties providing it was unnecessary to take testimony in the local office. The could held that the regulations of the Department of the Interior did not require in this case that the issue must first be tried out in the local land office where testimony could be taken and the decision of that office carried to the commissioner of the general land office for review only by appeal. From the decision of the commissioner by appeal the case could be carried to the Secretary of the Interior, who was required to determine it upon the record made in the first instance in the local land office. The court held that while procedure was regulated, this did not deprive the secretary of his general supervisory authority conferred by statute. The court of appeals affirmed the lower court and held that the Secretary of the Interior's dismissal of the adverse proceedings was a determination on the merits of the case and the correctness of the decision cannot be questioned in a collateral proceeding except for fraud.

This case involved sections of land in the Mount Diablo base and meridian California.

STORAGE TRANSFERS OIL TO INTRASTATE

By Charles E. Kern

New York Bureau, The Oil and Gas Journal

WASHINGTON, D. C., Dec. 17.—The storage of oil in a seaboard station transfers that oil from interstate and foreign transportation to interstate transportation when transported from the seaboard station to a point within the same state according to a decision of the Supreme Court of the United States just handed down. In this case the Standard Oil Co. of Kentucky was held entitled to interstate rates from Florida cities where the stations are maintained to points of shipment within the state.

This was the case of the Atlantic Coast Line Railroad, petitioner, against the Standard Oil Co. of Kentucky and the Standard Oil Co. of Kentucky, petitioner, against the Atlantic Coast Line Railroad. The decision was handed down by Chief Justice Taft, who remanded the cause to the district court for the district of Florida for further proceedings.

The Standard Oil Co. contended it was entitled to interstate rates, that is rates prevailing in the State of Florida, on oil shipped from its storage stations at Port Tampa. Tampa and Jacksonville Atlantic Coast Line Railroad applied interstate rates on the ground that it was continuity of shipment. Mr. Taft's opinion suggested that there was no indication of a prearranged destination on the part of the oil company beyond the primary storage station and that the reshipment of foreign or interstate shipment did not necessarily establish a continuity of movement or prevent the shipment of the article to a place within the same state as an interstate transaction.

LOUISIANA, ARKANSAS AND TEXAS STORAGE

HOUSTON, Tex., Dec. 17.—A total of 106,912,436 bbls. of crude was in storage in Texas, Louisiana and Arkansas on November 1, according to figures just compiled here. This was an increase of 1,555,025 bbls. over stocks of October 1.

The largest part of this gain in Texas although the greatest comparative increase was in the Louisiana Coastal territory. Including earthen and steel storage Texas stocks November 1 totaled 77,487,858 bbls.

Crude stocks by districts and fields on November 1 were:

Texas

	Barrels—Steel	Barrels—Earthen
North Central Texas including Eastland-Stephens Counties	13,497,566	.....
Powell	2,112,399	.....
Mexia district	8,772,673	.....
Panhandle	18,142,539	.....
West Texas	9,855,318	.....
Total Nov. 1	52,380,495	.....
Total Oct. 1	51,280,047	.....
Increase	1,100,448	.....
Gulf Coast and Southwest Texas—		
Boling	6,740	.....
Batson	5,838	.....
Big Cabin	50,000	.....
Damon Mound	7,360	.....
Dayton	1,000	.....
Barbers Hill	5,000	.....
Goose Creek	128,756	201,501
Hull	441,624	800
Humble	1,230,241	1,220,724
Lockhart (Lytton Springs	6,500	.....
Luling	440,750	.....
Liberty	48,482	.....
Markham	9,964	.....
Orange	248,816	30,000
Pierce Junction	78,372	.....
Saratoga	209,706	.....
Spindletop	5,173,885	175,000
Sour Lake	1,685,234	1,110,000
West Columbia	1,280,845	895,305
Laredo	1,568,511	.....
Total Nov. 1	12,627,624	3,633,330
Total Oct. 1	12,776,287	3,890,086
Decrease	148,663	256,756
Miscellaneous— (Refinery tank cars and terminals)		
Englewood	1,198,650	.....
Norsworthy	449,136	.....
Sinco	776,841	.....
Webster	1,166,486	.....
Texas City	2,398,000	.....
Lynchburg	98,210	.....
Baytown	2,448,296	.....
Pasadena	151,490	.....
Crosby	66,300	.....
Almeda	98,000	.....
Total Nov. 1	8,846,409	.....
Total Oct. 1	8,712,430	.....
Decrease	133,979	.....
Total Texas Nov. 1	73,854,528	3,633,330
Total Texas Oct. 1	72,768,764	3,890,086
Difference	1,085,764	256,756

Louisiana

	Barrels—Steel	Barrels—Earthen
Northern district—		
Shreveport district	3,797,719	.....
DeSoto	1,192,547	.....
Bull Bayou-Crichton	38,257	.....
Urania	107,503	.....
Cotton Valley	276,483	.....
Homer	3,116,231	.....
Haynesville	4,459,562	.....
Bellevue	213,449	.....
Total Nov. 1	13,201,751	.....
Total Oct. 1	13,160,102	.....
Increase	41,649	.....
Gulf Coast—		
Edgerly	7,500	.....
Evangeline	78,216	.....
Vinton	283,552	.....
Lockport	590,112	.....
Total Nov. 1	959,380	.....
Total Oct. 1	599,131	.....
Increase	360,249	.....
Total Louisiana Nov. 1	14,161,131	.....
Total Louisiana Oct. 1	13,759,233	.....
Increase	401,898	.....
Arkansas		
El Dorado	2,118,719	.....
Smackover	12,891,075	.....
Nevada County	253,653	.....
Total Nov. 1	15,263,447	.....
Total Oct. 1	14,839,328	.....
Increase	424,119	.....

Summary

	Nov. 1	Oct. 1
North and West Texas	52,380,495	51,280,047
Coastal and Southwest Texas—		
Earthen	3,633,330	3,890,086
Steel	12,627,624	12,776,287
Misc. Texas	8,846,409	8,712,430
Louisiana	14,161,131	13,759,233
Arkansas	15,263,447	14,839,328
Total	106,912,436	105,357,411
Increase Nov. 1	1,555,025	.....

UNIVERSITY ROYALTIES

AUSTIN, Tex., Dec. 17.—Payments of royalties on oil production on lands owned by the University of Texas, made to that institution in November, aggregated $251,000, compared with $263,823 in October.

HAZARD WIRE LINES

MR. J. E. WILLOUGHBY (in oval), *Production Supt., Texan Oil and Land Co.*

At left, *W. H. CLIFTON, Driller.*
L. H. LUNSFORD, Tool Dresser.

The First Hundred Days are the Hardest

Hazard 7/8" Drilling Line used on No. 1-B Well, drilled by the Texan Oil and Land Co. in constant use 100 days when these photos were taken. The total depth of hole was 6582 feet, straight reaming 5975 feet.

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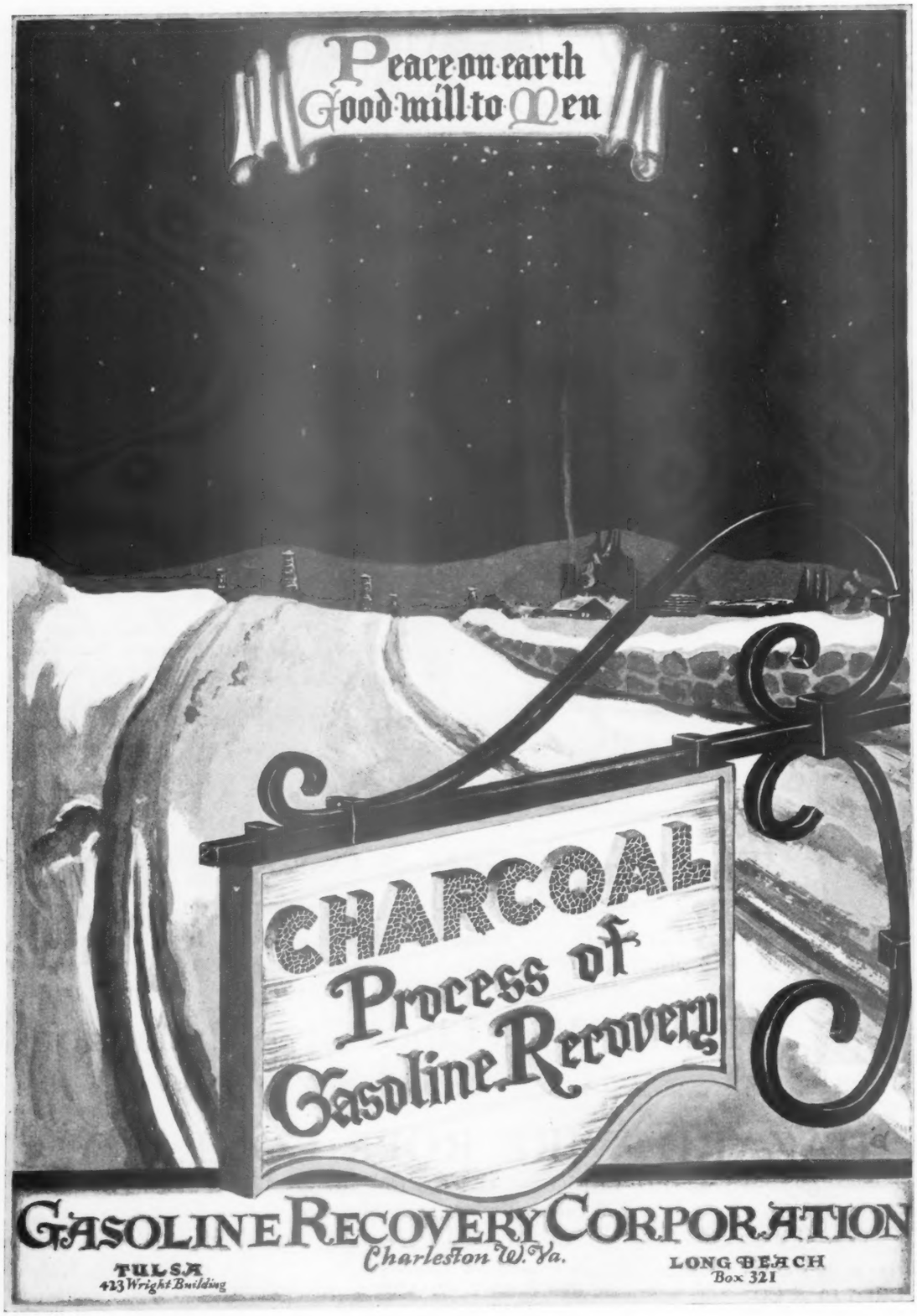
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EASTERN LOUISIANA CARBON DISPUTE

(Continued from Page 56)

merous others are being planned, which, if all are carried out, will create an enormous market in at least five southern and southwestern states which will tax the known reserves of Louisiana fields in the next few years. As a result there has

(Continued on Page 142)

been a keen demand by several major gas companies for gas rights and acreage the past few months not only in Richland Parish but in all likely gas territory of northern Louisiana.

In view of this looming domestic and industrial demand with a possibility of a shortage of gas in future due to a drain on the fields by the many projected lines, the Department of Conservation has, as its state authorized duty, to decide whether it is better that immediate relief be given gas producers and taxpayers of the parish, although much gas necessarily will be wasted by carbon black plants for domestic and industrial use, or whether more benefit would be accrued by conservation of the gas for pipe line use only.

Application for a permit to build a carbon black plant in the Richland Field was filed three months ago by the Century Carbon Co., which, if allowed, might mean the authorization of additional plants. This received the approval of many gas producers, who had been creating large gas reserves from which they had received but little returns. The move also was supported by taxpayers, who because of the poor school facilities and distressed conditions of the parish following the flood, had been needing more business enterprises to help bear the burden of taxation.

Gas transportation and distributing companies, which had been clamoring for additional reserves and sources of supply for their projects, immediately voiced protest with the Department of Conservation asking that the permit be not issued. An open meeting then was called to be held at Rayville, at which representatives of the carbon black company and taxpayers of the parish and their opponents, the gas line companies, presented their respective arguments before officials of the Department of Conservation.

Doctor Iron, head of the department, then took the arguments under consideration, but as no decision has been made, citizens have held a second meeting, a mass gathering of all taxpayers, at which resolutions were passed unanimously setting forth forceful reasons for immediate action and permission for the operation of carbon black plants in the parish.

In these resolutions various angles were presented in addition to the fact that carbon black plants were needed for immediate relief. These plants necessarily are local institutions, it was pointed out, with their pay rolls and income working in the parish, while gas lines, yielding only a nominal revenue to the field after the period of construction, are controlled by outside interests generally, taking the financial and other benefits of the gas away from the parish and state in which they belong and in which the gas is produced.

It also was claimed that a refusal to grant a permit for a carbon black plant "creates a monopoly for pipe lines and leaves to the commissioner the arbitrary power to grant or withhold permits." Further, according to the resolutions, pipe lines do not employ labor after the construction, while the carbon black industry does, utilizing scores of men and bringing in many new families to the locality.

Larger Market for Gas

How much gas eventually will be needed by gas lines is undetermined, but it is probable that it will be at least another year, possibly longer, before there will be any great drain on the field from this source. However, lines already assured, together with those contemplated, would have a total capacity of several hundred millions of feet of gas daily. The Interstate Natural Gas Co. line from Monroe to Baton Rouge now being extended to New Orleans, is looked upon as one of the biggest outlets. At present the line is not handling over 50,000,000 to 70,000,000 feet of gas daily, all of which is being obtained from the Monroe Field, but as soon as the project is completed into New Orleans, gas will be distributed both in that city and Baton Rouge, as well as in intermediate towns, refineries and other industries.

The Natural Gas & Fuel Corp. of El Dorado, which at present is using the old Crusader pipe line, is expected to build a line of its own from El Dorado down through the Monroe Field and into the Rayville district. This line would have a capacity to meet the needs of El Dorado and other Arkansas points, in which the company distributes because there is very little supply in Arkansas to count on with the declining volume and pressure in the Smackover Field.

The Moody-Seagraves interests of Houston, Tex., also are reported as having under consideration some kind of a project. They already are building a 22-inch line from Waskom, Tex., to Houston and Port Arthur, and because of their recent activities in purchasing gas rights and acreage and in drilling in Richland Parish it has been taken for granted that another line is planned to connect this field with the Waskom-South Texas project. This, however, would require the laying of a large line entirely across the state of Louisiana from east to west as Richland Parish is on the eastern side of Waskom, Tex., just over the western Louisiana line.

Franchises to distribute gas also recently were granted by the cities of Vicksburg and Jackson, Miss., to interests controlling the Ruston Drilling Co. of Ruston, La. To supply the gas to these cities a line would have to be built to the Richland Field, which is around 60 miles west of Vicksburg. Another line is "in the air," which reliable sources of information maintain is assured to link the Monroe and Richland Fields with St. Louis, Mo.

Carbon Black Market

Certain carbon black manufacturing companies in the Monroe Field which are opposing the issuing of a permit for a Richland Parish plant are doing so on the grounds that the carbon black situation is not any too favorable and that any new plants at this time would only tend to make the way harder by increasing production and weakening markets. It is explained that the market rarely is able to exceed 6 cents a pound as it is and that price, with the increasing cost of gas at the well due to growing demand for domestic and industrial consumption, is making the operation of plants difficult. The Century Carbon Co., seeker of the permit, however, claims to have a market already established for its proposed production and that if the Louisiana permit is refused the company will have to open a plant in Texas, in which state the carbon black restrictions are less stringent.

The carbon black question is one which has been up for discussion on numerous occasions in this state in the past. The fact that in the process of manufacture large quantities of gas necessarily must be lost to any other use through the incomplete combustion required to deposit the carbon has been an objectionable feature. However, the present need of carbon black for tires and inks makes the carbon black manufacture a vital industry to the nation and the burning of reasonable quantities of gas in this way to produce a necessary product is not considered a useless waste.

The carbon black industry from an efficiency standpoint is offering a vast field for development, and, as refiners of crude are attempting to increase their yields of gasoline per barrel of crude, so carbon black manufacturers are striving to perfect methods of boosting the weight of carbon which they can obtain from 1,000 feet of gas.

A new method of extraction of carbon now is being given a thorough test in the Monroe Field under a conditional permit. By this process, which is being tested by the New Process Carbon Co., it is claimed that the yield of carbon can be increased from 1 pound per 1,000 feet, the usual output, to 2 pounds per 1,000 feet.

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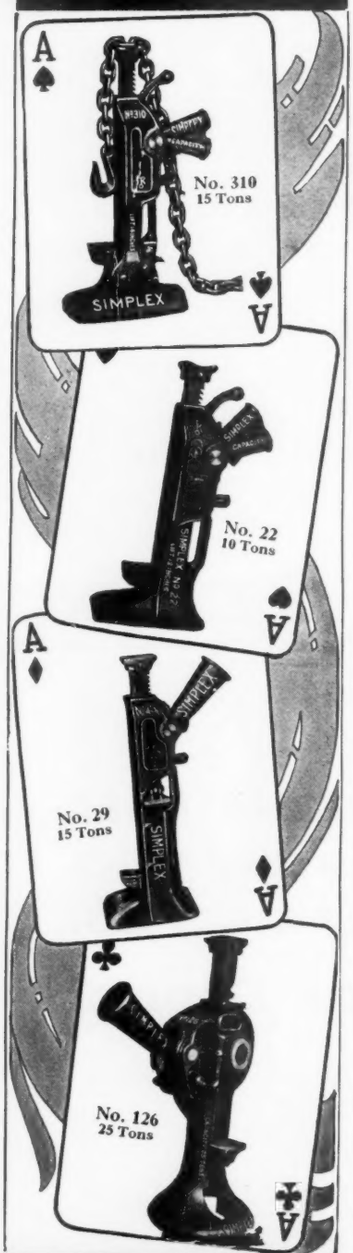

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How Science Has Helped Industry

Unsuspected Results of Study of Sun's Spectrum, Discovery of Tetraethyl Lead, Torsion Balance and Use of Gas

By Hugh S. Taylor*

Chairman, Central Petroleum Committee, National Research Council.

Sixty years ago the English astronomer, Sir Norman Lockyer, was engaged in fundamental research in the field of astronomy. He found with the aid of the spectroscope a bright line in the spectrum of the sun which pointed to the existence in the sun's atmosphere of prodigious quantities of an element not yet known to earth. It would have been difficult at that early date to persuade the infant petroleum industry, then about 10 years of age in this country, that it might be worth while to subsidize the investigations of the astronomer. Thirty years later, in a tiny room in University College, London, Sir William Ramsay was investigating the hitherto unsuspected constituents of the air, which we know as the inert gases, ranging from the helium of Sir Norman Lockyear's investigations to the heaviest of those elements, xenon. Even at that time it would have been difficult to obtain subsidy for these apparently nontechnical investigations by the now thriving petroleum industry, or even by the electrical industry. And yet, before another 30 years were out, both of these industries were to be making practical utilization of these investigations. The great war showed the use of helium in the filling of dirigible airships, and practicable sources of that helium supply were the natural gas wells of the petroleum areas. Quite recently we read of the corresponding utilization of neon in the production of gas-filled discharge tubes for outside illumination purposes.

Tetraethyl Lead Example

There are probably few in this audience who know anything concerning the original investigations of such substances as lead tetraethyl. There would probably be a consensus of opinion, however, among all the members present that it would have been difficult to persuade the petroleum industry to provide the individual engaged upon such work with adequate financial backing for its prosecution with vigor. Neither he nor the petroleum industry knew at the time that what was, in 1920, a rare specimen in a few isolated chemical museums, would become in the space of five short years, a commodity of such importance in the petroleum field that production on a scale of 100 tons per month would be required.

These examples should suffice to indicate to the members of this audience what the breadth of research investigation may be which is pertinent to progress in the industrial utilization of petroleum. It is with such examples in mind that the petroleum industry should approach any program of research to which it has been committed. The scope of investigations in which the industry is interested is almost limitless.

Like Growth of Snowball

The development of research resembles in many respects the growth of a snowball. From small beginnings it may grow into undertakings enormous in size and scope. Let us cite once more by way of illustration the case of lead tetraethyl. The value which such a compound might have in the petroleum industry was certainly far from the mind of the original investigator, nor could he have foreseen the very extended program of research which might arise from its application to petroleum problems. For the value of lead tetraethyl as a knock suppressor has reopened once more the whole problem of the nature and constituents of petroleum hydrocarbons, more especially those of gasoline, cracked or straightrun.

The results announced by Dr. Graham Edgar of the Ethyl Gasoline Corp. that normal octane is a bad knocking fuel, whereas the branch-chain octane has practically no knocking characteristics indicates to the petroleum industry the need of a program of research in pure science which is essential and vital to its progress. With this in mind, one can see the implications of those projects authorized by the central petroleum committee of the National Research Council, which deal with the noncatalytic thermal decomposition of pure hydrocarbons and related compounds, being undertaken by Doctor Hurd of Northwestern University, and the similar projects concerning petroleum hydrocarbons being carried out by Doctor Pease at Princeton University and at Pasadena. It is essential that some data shall be obtained regarding the decomposition of pure hydrocarbons, their reaction with hydrogen, with oxygen, and with steam. The more that is known concerning the properties of the pure hydrocarbons the better can the problems confronting the technologist, interested in cracking, be stated. And the statement of the problem is very frequently the prelude to its solution.

Eotvos Balance

The same line of argument is applicable to such projects as No. 6, 8, and 9, where the response of hydrocarbons to the action of the silent discharge, of ionization and fractional condensation are being studied. There may be a tendency to discount the value of studies which at the time seem to be so essentially nontechnical in their nature. The same attitude, however, might well have been adopted towards the fundamental investigations of Barou Eotvos, the Hungarian physicist, in his measurements of gravitation by means of the torsion balance. Twenty years ago it would have required a scientist very skilled in the art of salesmanship to obtain the interest of a petroleum directorate in the problem of gravitational variation at the earth's surface. Today, however, every oil-finding organization knows the value which attaches to such scientific methods of oil finding as opposed to the geological and practical methods of the past depending only on surface observations. This consideration makes an enormous difference in the decision as to the wisdom of a project and it is the hope of the central petroleum committee of the National Research Council and the American Petroleum Institute that is building not for the present entirely but also for the future.

Doherty's Proposals

The methods of oil recovery have undergone a revolution within the space of a few short years. The gusher, that symbol of waste in the petroleum industry, has acquired in its symbolism a deeper significance. It is now recognized not only as a symbol of lost oil but also as a symbol of lost gas pressure and with that lost pressure, loss in the rate of oil flow, of oil quality and in ultimate yield of oil from the reservoir. The revolutionary proposals of Mr. Doherty with reference to the function of pressure in oil recovery and the fundamental studies of the effect of pressure in lowering the viscosity and surface tension of oil saturated with natural gas under pressure by his engineers have been translated into recovery practice in a number of oil fields. The procedure, whether of backpressuring, stop-cocking, or of repressuring, has been endorsed by representative petroleum technologists throughout the industry. At Ponca City, in October last, there was virtually unanimous agreement that the conservation of gas and of gas pressure is of paramount importance in the conservation and economical production of oil. It is certain, however, that the factors which are controlling in the production of oil from the sand reservoir are not yet fully understood. As has been pointed out to me by Mr. Doherty in a private communication, it is difficult as yet to harmonize "the records made by the gusher wells in our different pools and the experiments made as to the flow of oil through sands as reported by many laboratory tests." Here then is work for the investigator as to the physical facts governing oil production.

Inadequacy of Means

Our research program thus far sanctioned is open to criticism. None are more keenly aware of this than are the members of th ecommittee. The faults committed are, however, attributable to the magnitude of the problems that face the industry, the inadequacy of the means available for their solution and the difficulty of securing thoroughly satisfactory personel. At first thought such a statement might seem curious for a committee which controls an annual income of $100,000 and yet it is to a large extent true. For, very much more so than in other foundations, we face the competition of the industry. The really first-class men in petroleum problems are nine times out of ten snapped up by the industry at salaries with which the central petroleum committee cannot compete. In spite of this the committee has succeeded in securing the services of a certain number of able fellows whom it proposes to retain as long as they are willing to serve.

For the funds available the program may have been too broadly spread to obtain the maximum good. That is worth consideration. The problems studied may not be those requiring the most urgent solution. It is for these reasons that we come before you today. You are the professional men in this problem. It is largely your problem, as well as ours. It is your responsibility as well as ours that the research programs shall succeed. For the industry needs, more today than ever before, a fresh stream of fundamental scientific studies, which it can translate into technical operations and procedure to the better conservation and utilization of its limited raw material. We welcome therefore your criticisms, your suggestions, your advice. For we aim to be in the highest sense of the word servants of the petroleum industry.

*Before American Petroleum Institute, Chicago.

MEDAL AWARDED FOR ACETYLENE STUDIES

At the recent annual meeting of the International Acetylene Association, held in the Stevens Hotel, Chicago, Dana Pierce, president of the Underwriters' Laboratories, Inc., accepted for his organization the Morehead gold medal, the association's annual award for exceptionally meritorious service in the production and utilization of calcium carbide and acetylene.

In presenting the medal, R. A. Sossong, past president of the association, paid a tribute to the Underwriters' Laboratories as an organization and to individuals connected with the laboratories who have contributed to the safety and standardization of the various apparatuses in which acetylene is used and made.

NEW PRESIDENT OF DELTA

W. B. Stephenson has been elected president of the Delta Electric Co., Marion, Ind., succeeding J. W. Stephenson, who becomes chairman of the board of directors. Delta's new president has been the active head of the business as treasurer and general manager. His election to the presidency follows the recent purchase by Delta of Accessories Manufacturing Co., Chicago.

This Is the Way They Said
"Merry Christmas"
When JARECKI Was Established

. . . . Many things have changed since 1852, when JARECKI was established, but the spirit of Christmas remains much the same.

There is still the good cheer, still the friendly warmth, still the season of well-wishing.

JARECKI closes the seventy-fifth year of its business existence with the wish for seventy-five years of peace, happiness and prosperity for you!

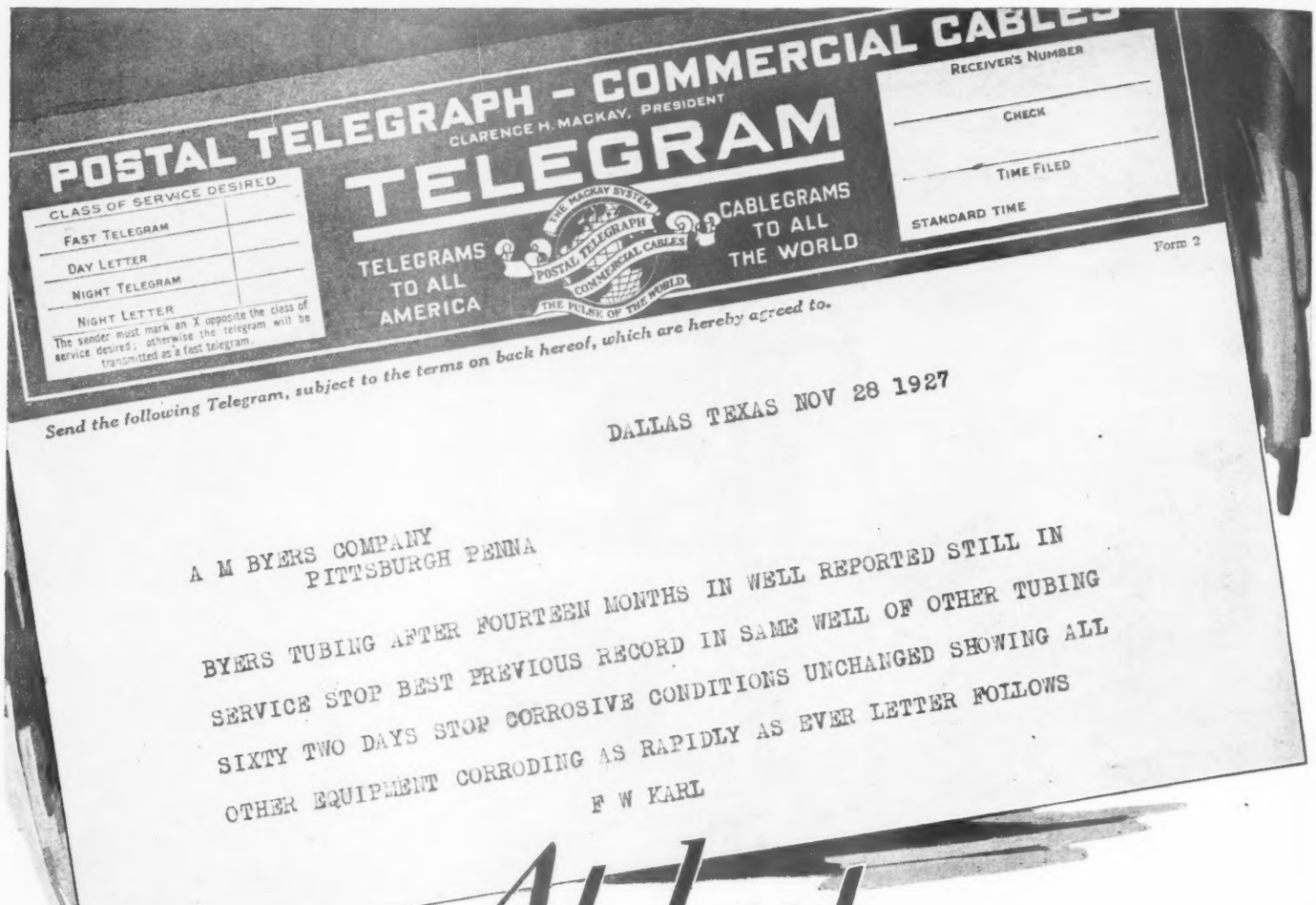
Jarecki

MANUFACTURING COMPANY

Home Office and Factory—Erie, Pa., U. S. A.
General Office, St. Louis, Mo.

Branch stores at all important places in the Oil Country.

District Offices { Pittsburgh, Pa.; El Dorado, Kan.; Tulsa, Okla.; Newark, Ohio; Eastland and Dallas, Texas; Lawrenceville, Ill.


POSTAL TELEGRAPH - COMMERCIAL CABLES
CLARENCE H. MACKAY, PRESIDENT
TELEGRAM
RECEIVER'S NUMBER
CHECK
TIME FILED
STANDARD TIME
CLASS OF SERVICE DESIRED
FAST TELEGRAM
DAY LETTER
NIGHT TELEGRAM
NIGHT LETTER
The sender must mark an X opposite the class of service desired; otherwise the telegram will be transmitted as a fast telegram.
TELEGRAMS TO ALL AMERICA
THE MACKAY SYSTEM
POSTAL TELEGRAPH
COMMERCIAL CABLES
THE PULSE OF THE WORLD
CABLEGRAMS TO ALL THE WORLD
Form 2
Send the following Telegram, subject to the terms on back hereof, which are hereby agreed to.
DALLAS TEXAS NOV 28 1927
A M BYERS COMPANY
PITTSBURGH PENNA
BYERS TUBING AFTER FOURTEEN MONTHS IN WELL REPORTED STILL IN SERVICE STOP BEST PREVIOUS RECORD IN SAME WELL OF OTHER TUBING SIXTY TWO DAYS STOP CORROSIVE CONDITIONS UNCHANGED SHOWING ALL OTHER EQUIPMENT CORRODING AS RAPIDLY AS EVER LETTER FOLLOWS
F W KARL

At last ~

Tubing Service Vastly Improved

The record referred to above is only one out of a great many showing the remarkable rust-resisting properties of Byers galvanized tubing.

At first blush, your thought will be that any galvanized tubing will give equally good service, regardless of what the best metal may be. Nothing could be further from the truth, as has been repeatedly shown in corrosion tests. The reasons are simple:

The surface of Byers Pipe is made very rough in the pickling process, soaking up zinc like a sponge, and holding it in a *vise-like grip.* This is most important, for zinc in itself is a brittle metal which with handling and wear tends to flake or peel off when applied on steel pipe.

the *Spiral Stripe* protects you against mistakes and substitution

Also look for name and year rolled in metal

Make this Test!

Crush a piece of Byers galvanized pipe flat with a hammer, also a piece of steel pipe, and note how the galvanizing sticks to the former and flakes off the latter! In this difference lies the secret of the much greater durability of Byers galvanized tubing, compared with any other pipe not made of genuine wrought iron.

Caution!

Note: Do not confuse Byers with pipe made from so-called "iron," refined in open hearth furnaces. The latter contains no slag (which gives Byers its rough surface) and is, in fact, only good open hearth steel, of low carbon content, sold under various fancy names.

Write for further information.

A. M. BYERS COMPANY

Established 1864 Pittsburgh, Pa.

DISTRIBUTORS

Jarecki Mfg. Co. Oil Well Supply Co.

Norvell-Wilder Hardware Co.

BYERS GALVANIZED Tubing

GENUINE WROUGHT IRON

WATER TREATMENT AT GASOLINE PLANTS

(Continued from Page 97)

but if the hardness is known to be in excess of the alkalinity no sodium carbonate can be present. Then we can safely use enough lime to eliminate the 13 parts per million of alkalinity.

Now by equation we find calcium bicarbonate plus calcium hydrate equal 2 calcium carbonate plus 2 water. Substituting the molecular formula or chemical weights for the formula, we find 162.1 plus 74.1 = 2 (100.1) plus 2 (18) or 162.1 plus 74.1 = 200.2 plus 36. The equation is thus proven mathematically and chemically correct. One part of alkalinity, however, does not represent 1 part of calcium carbonate, but 1 part of calcium monocarbonate; in the form of calcium bicarbonate, and by reactions we find calcium carbonate plus carbonic acid plus water = calcium bicarbonate and conversely calcium bicarbonate must equal calcium carbonate plus carbonic acid plus water then we can make this equation read calcium carbonate plus carbonic acid plus water plus calcium hydate = 2 calcium carbonate plus 2 water. Substituting the molecular weight we have 100.0 plus 44.0 plus 18.0 plus 74.1 = 2 (100.1) plus 2 (18.0) or 100.1 plus 44 plus 18.0 plus 74.1 = 200.2 plus 36.0 or 236.2 = 200.2 plus 36.0 or 236.2.

As each part of alkalinity does not represent one part of calcium monocarbonate, and as the preceding equation employs a formula wherein the calcium bicarbonate is reduced to its monocarbonate form, it is readily seen that 100.1 parts of alkalinity will require 74.1 parts of lime or calcium hydrate to reduce 162.1 parts of bicarbonate to the monocarbonate form or insoluble state. Therefore 1 part of alkalinity will require as much lime as 100.1 is to 74.1 as 100 is to x = .7402. Now if 1 part of alkalinity requires .7402, 13 parts will require 13 × .7402 = 9.62 parts per gallon. To convert into grains per gallon multiply by .0584.

Lime required: Alkalinity plus acidity (carbonic acid) 0.056 = lime required per thousand gallons of water.

Soda ash: Hardness minus alkalinity × 0.093 = soda required per 1,000 gallons. Hardness minus alkalinity = deficiency of soda ash. Alkalinity minus hardness = excess of soda ash. Alkalinity minus causticity = deficiency of lime and causticity minus alkalinity = excess of lime.

SOUTHWEST TEXAS

(Continued from Page 41)

No. 6 Nixon, Survey 119, located 2,750 feet to north line, is setting surface casing at 200 feet. Southern Gas Utilities' No. 3 Schmidt, Survey 71, located 1,447 feet to west and 1,340 feet to south line, is deepening from 1,040 feet. C. E. Lange & Jake Jarmon's No. 1 Adams, Survey 71, located 500 feet to north and west lines, is shut down at 60 feet.

Kingsville Field—Kleberg

Houston Oil Co.'s No. 3 Kissman, Survey 41, Block 10, located 500 feet to north and west lines, has derrick up. Humble Oil & Refining Co.'s No. A-4 Dennett, Lot 1, Section 39, located 550 feet to north line and 150 feet to west line, is drilling at 1,125 feet and using rock bit and making slow progress, lots of pyrites.

Refugio Gas Field—Refugio

Coast Gas Co.'s No. 2 Shelly is drilling at 2,100 feet. Houston Oil Co.'s No. 4 Rooke is rigging up to deepen; No. 5 Fanny Heard has set casing at 2,592 feet; No 8 W. J. J. Heard is drilling in hard sand at 2,453 feet; No. 1 Smith Heard is rigging up to deepen; No. 11 W. J. Heard at 2,587 feet cored hard sand; No. A-2 Rooke is drilling. Houston Gulf Gas Co.'s No. 1 Vance is deepening from 1,600 feet; No. 3 Heard has set surface casing; No. 4 Heard is drilling at 2,010 feet.

White Point Gas Field—San Patricio

Houston Oil Co.'s No. 1 Humble is ready to drill in; No. 3 Humble has derrick up; No. 4 Humble is drilling in gumbo at 1,910 feet; No. 5 Humble is location; No. 2 Ragsdale has set casing at 453 feet; No. 3 Ragsdale is location. Mission Drilling Co.'s No. 1 Morris is drilling at 1,100 feet; No. 1 Hunter has set surface casing at 300 feet; No. 3 Cage is location. Saxet Oil Co.'s No. 1 White Point Development Co. is location; No. 2 White Point Development Co. is drilling in shale at 1,230 feet; No. 8 Rachal is in sand at 2,335 feet; No. 9 Rachal is drilling; No. 10 Rachal is standing at 400 feet; No. 12 Rachal is ready to drill in at 2,312-16 feet; No. 7 Dunn is location; No. 9 Dunn is location; No. 1 Henry is location; No. 1 Hunter is waiting on water.

SOUTHWEST WILDCATS

(Continued from Page 41)

nales, Baluarto grant, is drilling at 3,000 feet. T. G. Shaw's No. 1 Jones, Survey 381, Block 12, located 171 feet to south line and 468 feet to west line, is drilling at 900 feet.

Hidalgo County

Queen City Oil & Gas Co.'s No. 1 Adams, Lot 1, Block 82, 3 miles north of Mercedes, is fishing at 2,155 feet.

Starr County

The Texas Company has spudded in a test in Porcion 75, Block 13. Kusch Exploration Co.'s No. 1 Frank Doyno and others, Porcion 75, Block 13, is drilling water well. Clark & Woodruff's No. 1 Kelsey, Porcion 76, east one-half of Porcion 75, west one-third of Porcion 77, is drilling at 500 feet. J. E. Harston's No. 1 Guerra, Survey 43, located 660 feet to south line and 1,320 feet to east line, is drilling at 510 feet.

Atascosa County

Lumberman's Oil Co.'s No. 1 Shaw, Block 331, north central, is drilling.

Bastrop County

Noack & Laning's (Kelly) No. 1 E. Roemer, Isaac Casner League, 150 feet to NE cor., is shut down at 1,935 feet.

Blanco County

C. W. Bates' No. 1 Herman Massey, Henry Manson Survey, 920 feet to north line and 660 feet to east line of survey, is preparing to move in. Robert Rodson's No. 1 Glasscock, Survey 50, located 150 feet to CEL, is erecting derrick and moving in rig.

Caldwell County

Alexander-Lyles & Adams' No. 1 Ballard, William Spillars Survey, has spudded in. Charley Hirtz' No. 1 Will Parr, is location 2,700 feet east of Austin road and 200 feet to north line of farm. John S. Storey's No. 1 Mrs. Thomson, John Lawrence Survey, 150 feet to north line and approximately 600 feet to east line, is location. The Texas Company's No. 1 Robuck, Ben McCulloch Survey, is moving in machinery.

DeWitt County

Empire Southern Oil Co.'s No. 2 Smith, Survey 3, located three quarters of a mile west of No. 1, at 2,960 feet (corrected depth) is trying to bring in a well, making heads now and then and blowing gas, but bridges and is setting new liner.

Dimmitt County

Humble Oil & Refining Co.'s No. 1 City National Bank, Survey 654, located 700 feet to north and 2,000 feet to east lines, is drilling at 4,387 feet.

Edwards County

Devil's River Oil & Gas Co.'s No. 1 Terney, C. C. S. D. & R. G. N. G., Section 167, located 2,640 feet to north and 660 feet to west line, is shut down at 45 feet.

Frio County

Karnes and others are making location for test 14 miles southwest of Moore. Lain & Brown's No. 1 Edwards, Hooper & Wade Survey, 920 feet to CNL, is standing at 1,250 feet waiting on rock bit. P. A. Neilan's No. 2 Blackaller, James Gouley Survey, is drilling at 2,820 feet in Eagle Ford.

Goliad County

C. W. Simpson's No. 1 Ideus, W. H. Pendleton Survey, 156 feet to north line and 540 feet to west lines of lease, is in hard lime at 2,323 feet; had sand carrying gas and water.

Guadalupe County

F. A. Lain's No. 1 Weinert, W. K. Estell Survey, 150 feet to CNL, is rigging up to deepen from 3,004 feet. Eugene Sight's No. 1 Fred Kruger, Isaac Baker Survey, located 450 feet to north and west lines, is shut down at 2,180 feet.

Hays County

J. E. Rodgers' No. 1 Hohenburg, 2½ miles east of San Marcos, is fishing at 2,093 feet with small oil showing.

Kerr County

Walker-Van Duyn's No. 1 Barfield, B. B. Peck Survey, 4,700 feet to north line and 450 feet to east line, is drilling in shale at 1,000 feet.

LaSalle County

Sun Oil Co.'s No. 1 Washburn, Survey 157, located 3,500 feet to north line and 3,400 feet to west line, is drilling at 2,290 feet in Cook Mountain.

Live Oak County

Simmons Oil Corp.'s No. 1 McGriff, near Oakville, at 256 feet blew out and is estimated commercial gas well and is being completed.

San Patricio County

Ed R. Herwick's No. 1 Tsesmelis is drilling. National Oil Co.'s No 1 Sullivan, J. C. McMullen Survey, 500 feet to SW cor., has resumed drilling at 1,138 feet. George Pickett's No. 1 Garrett is shut down at 3,030 feet; No. 1 Whitworth, NW NW Survey 60, is drilling at 1,960 feet. John Sigmund's No. 9 Robinson, 350 feet SE of No. 7, is deepening from 1,928 feet.

Travis County

Roy Clark and others' No. 1 Carl Jacobson, C. Harrison Survey, 500 feet to east line of farm, is drilling at 450 feet. T. P. Garrett's No. 1 Rowe, R. Hornsby Survey, 900 feet to north and east lines, at 600 feet had oil showing on slush pit.

Uvalde County

Pure Oil Co.'s No. 1 J. D. Smythe, Survey 687, located 740 feet to north line and 146 feet to east line of SE cor. or Survey 60, is drilling in black shale at 1,055 feet.

Val Verde County

East Del Rio Oil Co.'s No. 1 Russell is cleaning out at 3,210 feet in Section 183. Independent Operator's No. 1 Whitehead, SE SE Section 30, Block 4, is shut down at 3,925 feet. Magnolia Petroleum Co.'s No. 1 Whitehead, Survey 81, in black shale at 5,430 feet, is shut down for engine trouble. O. O. Owens and others' No. 1 Mills, Section 128, Block 1, is drilling in lime and shale at 3,280 feet. W. V. Thraves' No. 1 Wilson, Section 115, is drilling at 80 feet.

Zavala County

J. G. Pundt's No. 1 West, Fuentes Survey, NW cor., is in sand at 1,310-12 showing gas and oil, casing set at 1,292 feet and will drill in about December 21. Western Gas & Fuel Co.'s No. 1 West, northern part of county, is in basalt at 876 feet, topped at 735 feet.

LA.-ARK. WILDCATS

(Continued from Page 38)

4 feet of sand, 2,639-43 feet in No. 1 Horn, Section 17-17-13, Union County, with tester and after drilling 100 feet deeper made another drill stem test at 2,747 feet.

Winn Wildcat Revived

Abandoned at 525 feet with the bottom 35 feet in rock salt, H. M. Roark and others' No. 3 Southern Minerals Co. in Section 19-11-3w sprang a surprise during the week when it staged a gas show accompanying a substance which looks like oil, but which even the most sanguine enthusiast of Winnfield says isn't. Although abandoned two weeks ago, the rig was never moved off the derrick and Roark's drilling superintendent, so the story goes, went back to the well, fired up and made a few feet more hole going out of the salt and into a rotten lime and sand formation at 580 feet. After passing through 80 feet of rock salt and 8 feet of this sandy lime, he hit a show of gas and "oil" that kicked the bailer and covered the pit with what, from descriptions, is dead oil. Then he shut down awaiting orders. It is expected, however, that drilling will continue to discover just what this salt dome test will develop.

As a matter of record, there were only two wildcat completions in all the Shreveport territory during the week, both by the Ohio Oil Co. and both in that company's hunting ground in northwestern Caddo Parish west of Rodessa. Both were dry, one a shallow test and the other below 3,000 feet. The company has drilled a half dozen holes in this locality within the past year or 18 months. No. 1 E. Plum, in Section 32-23-16, was abandoned at 1,619 feet after standing as temporarily abandoned since the latter part of June, and No. 1 Thompson in the same section was abandoned as a dry hole at 3,197 feet.

NORTH LOUISIANA

Bienville Parish

Lakeside Oil & Gas Co. has developed a small gas show in 3 feet of sand 2,528-31 feet in No. 1 State, Section 16-16-10, and is shut down waiting to get casing set for a test.

Bossier Parish

Doern and others' No. 1 Bollinger, Section 9-22-11, is drilling at 3,410 feet. H. S. Goodwin killed a salt water flow with about 5,000,000 feet of gas at 2,604 feet and has pulled and reset 6-inch casing at 2,600 feet in No. 1 Curtis, Section 2-16-13. Hamiter and others are drilling No. 1 Hamiter, Section 10-23-13, at 350 feet. Walker and others' No. 1 Antrim in Section 28-22-13, is drilling at 2,620 feet.

Caddo Parish

Arkansas Natural Gas Co. has rig up on No. 1 Alexander, Section 20-16-15. Greenwood Production Co. tested dry in 14 feet of sand at 1,970-84 feet with Halliburton tester, in No. 1 Cooper & Ellerbe, Section 15-18-14, and is arranging to make another drill stem test at 2,000 feet. Tubbs and others' No. 1 Hines, Section 9-14-16, cemented 6-inch casing at 2,268 feet. Woodley Petroleum Co. began drilling No. 5-B Knight, Section 39-15-12, December 12 and has 10-inch surface string set at 105 feet. Woodley & Collins are setting 6-inch casing at 2,525 feet on No. 1 McVey, Section 23-19-14, total depth 2,569 feet.

Catahoula Parish

S. D. Hunter is drilling sandy shale at 3,085 feet on No. 2 Tensas Delta Land Co. in Section 21-9-7. Lochnager Oil & Gas Co. twisted off 248 feet of drill stem and has a fishing job at 3,070 feet on No. 2 Beasley, Section 26-9-6e, total depth 3,318 feet; No. 1 Miller, Section 29-9-6, is in sand at 3,020 feet. Standard Oil Co.'s No. 1 Tensas Delta, Section 23-8-5, is in gumbo at 2,500 feet.

Claiborne Parish

Magnolia Petroleum Co. is taking a core at 4,662 feet in No. 1 C. C. Lee, Section 16-22-8.

DeSoto Parish

Benson Oil Co.'s No. 1 Wolff, Section 3-10-13, is bailing and swabbing about 90 bbls. of 43 gravity oil from 12 feet of sand, 2,996-3,008 feet and is arranging to set tubing with packer to make it flow, there being a small amount of gas with the oil. Carlton Drilling Co. is down 220 feet in No. 1 Stevens, Section 12-11-16. Dixie Oil Co.'s No. 1 Jenkins, Section 9-12-11, is drilling lime at 5,868 feet. J. W. Downey's No. 1 Dickson, Section 24-14-13, is drilling at 1,000 feet. Foster and others are drilling No. 1 Johnson, Section 7-10-13, at 1,350 feet.

Franklin Parish

Louisiana Petroleum Co. has shut down Noll Tensas, Section 11-11-6, at 2,503 feet.

Grant Parish

W. D. Ball and others are down 2,106 feet with No. 1 Calhoun, Section 4-7-4w.

Rapides Parish

Collins Brothers, drilling No. 1 Allen in Section 25-5-1w, are shut down at 1,410 feet.

Sabine Parish

S. P. Borden and others' No. 1 Logan, Section 36-10-13, is drilling at 2,273 feet. Dixie Oil Co. is fishing for drill stem in No. 1 Steinfelt, Section 20-10-12, total depth 1,800 feet. W. G. Doerne has rig up to drill No. 1 Pickering Lumber Co. in Section 17-4-11. L. M. Emlet is running sand pump to clean out No. 7 Bowman-Hicks, Section 14-7-14. The wildcat bailed dry with a little oil at 3,533 feet a week or so ago, was deepened to

3,560 feet and bailed again with only slightly better results.

Webster Parish

S. A. Lane's No. 1 Miles, Section 24-17-9, is shut down at 1,469 feet.

West Carroll Parish

Palmer Corp. is drilling 6-inch plug from No. 1 White, Section 2-19-10, at 2,418 feet preparatory to testing 16 feet of sand, 2,450-66 feet which developed a good gas show 10 days ago.

Winn Parish

Ohio Oil Co.'s No. 2 Rolen, Acct. 1 in Section 5-12-1w, is drilling at 3,109 feet.

ARKANSAS

Bradley County

Johnson & Adams have gone back to No. 1 Southern Lumber Co. in Section 12-12-12, standing with 6⅝-inch casing cemented at 2,200 feet since last May and are drilling plug. The wildcat had 3 feet of sand 2,001-04 feet, which showed a little oil.

Clark County

William Henry, trustee, has derrick up on No. 1 Clark, Section 34-9-21.

Columbia County

Sunny Jim Oil Co. is drilling lime at 1,705 feet in No. 1-A Runyon, Section 3-16-21.

Lafayette County

Kensaw Syndicate's No. 1 Kensaw, Section 31-19-24, is drilling at 3,310 feet.

Miller County

Guest and others are drilling at 1,825 feet on No. 1 Saunderson, Section 14-15-26, and Lenz and others' No. 1 Mann, Section 28-15-26, is shut down at 3,030 feet.

Poinsett County

Aarnes and others' No. 1 Aarnes, Section 23-10-6, is drilling at 1,250 feet.

Pope County

Natural Gas & Fuel Corp. has begun drilling No. 1 Whorton, Section 7-8-21, but shut down to lay a water line after drilling 473 feet.

Nevada County

McDonald and others' No. 1 Pelt, Section 9-15-22, set a short string of 6-inch casing at 2,195 feet, tested salt water in 18 feet of sand and are drilling deeper.

Ouachita County

H. M. Harrell trustee's No. 1 Ponder in Section 18-12-17, 10 miles north of Camden, is drilling at 1,450 feet. Magnolia Petroleum Co.'s No. 1-B Stout Lumber Co. in Section 28-14-16, is drilling gummy lime at 3,240 feet.

Union County

Booth and others' No. 1 Rowland, Section 8-7-11, is drilling at 3,028 feet after a drill stem salt water test at 2,966 feet. W. R. Keever has rig up for No. 5 Ezell, Section 12-17-15. Lion Oil & Refining Co. was dry in 4 feet of sand 2,639-43 feet on Johnson test in No. 1 Horn estate, Section 17-17-13. Pitcher and others' No. 1 Arkansas Timber Co. (second hole) is drilling at 570 feet. Pitcher & White are drilling at 1,275 feet in No. 1 Kinard, Section 17-15-19.

EAST TEXAS

Shelby County

Magnolia Petroleum Co. is drilling at 3,315 feet on No. 1 Pickering in the W. J. Crane Survey.

MISSISSIPPI

Jeff Davis County

Cherokee Petroleum Co. is coring No. 1 Burkett, Section 14-6-18, after taking 2 feet of sand which they claim showed a little oil at 3,138-40 feet.

Lauderdale County

Lauderdale Oil & Gas Co. is coring lime at 2,800 feet in No. 1 Gunn, Section 13-7-16.

Lee County

J. P. Evans' No. 1 Whitesides, Section 16-9-7, claims another oil show, its second at 1,700 feet but passed it up and is drilling at 1,800 feet.

LOUISIANA-ARKANSAS

(Continued from Page 38)

O'Brien Brothers began drilling No. 1 Farrington, Section 21-23-12, December 9 and have set 8-inch casing at 809 feet.

Elm Grove and Sligo: J. S. McCullough has made location for No. 5 Hodges, 650 feet south and 438 feet west of the center of Section 25-16-12, and is rigging up to drill. The Palmer Corp. is drilling at 1,110 feet on No. 1 Lewis Burke in Section 26-17-12.

Caddo Parish

Pine Island: Arkansas Natural Gas has drill stem stuck in No. 1 C. W. Lane, Section 31-21-15, total depth 4,090 feet. Dixie Oil Co. will pass up a gas show at 3,681 feet in No. 9 Clark, Section 14-21-15; No. 19 Caddo Mineral Lands, Section 23-21-15, is bailing, total depth 3,909 feet; No. 92 Dillon, Section 13-21-15, cemented 10-inch casing at 2,368 feet and is drilling at 2,480 feet; No. 1 D. D. Huckaby, Section 33-22-15, has begun drilling and No. 4 H. H. Huckaby, Section 11-21-15, is drilling lime at 3,400 feet.

Gulf Refining Co. has cemented 3,900 feet of 4¾-inch casing in No. 10 Herndon, Section 15-21-15, total depth 3,921 feet, and No. 14 Tyson, Section 14-21-15, cemented 4¾-inch casing at 3,934 feet, total depth 3,939 feet. Haynes Brothers' No. 1 Spell in Section 15-21-15, cemented 5⅛-inch casing at 3,911 feet.

Magnolia Petroleum Co.'s No. 8-A Hampton, Section 15-21-15, is shut down at 3,504 feet waiting for boiler water; No. 21 Robertshaw, Section 23-15-21, is bailing 5¾-inch casing, total dep h 3,928 feet; No. 22 Robertshaw, in the same section, is drilling at 3,217 feet. Ohio Oil Co.'s No. 25 E. K. Smith, in Section 12-21-15, is drilling hard lime at 5,460 feet. Palmer Corp.'s No. 1 Sellington, Section 17-21-14, is drilling at 4,391 feet. Shreveport Oil Corp. has derrick up for No. 2 Muslow, Section 32-21-15.

The Texas Company's No. 50 Caddo Mineral Lands, Section 23-21-15, has 6¼-inch casing cemented at 3,850 feet; No. 21, same lease and section, has set 3,811 feet of 4½-inch casing and is arranging to blow with air; No. 8 A. Herndon, Section 14-21-15, cemented 10-inch casing at 2,600 feet and rig is up for No. 9. No. 10 J. K. Herold in the same section is coring at 3,925 feet, and No. 10 Mabry, Section 15-21-15, is drilling at 3,929 feet. No. 19 D. H. Raines, Section 15-21-15, is arranging to make a Halliburton test at 4,036 feet.

Greenwood: Ferguson and others have derrick up for No. 2 Abney, 1,488 feet south and 445 feet east NW cor. Section 7-17-16. Greenwood Production Co. has 10-inch casing at 105 feet and 6-inch at 902 feet in No. 1 Alexander, Section 27-18-16. Magnolia Petroleum Co. is reaming to bottom, 2,548 feet, on No. 1 John Furrh, Section 32-18-16 Waterman Brick & Tile Co. is waiting for cement to set after running 8-inch casing at 895 feet on No. 1 Waterman, Section 18-17-16.

Mooringsport, Oil City, Vivian and Hosston: W. D. Chew's No. 7 fee, Section 33-21-16, is drilling at 1,860 feet. Simplex Oil Co.'s No. 1 Hunsicker, Section 15-20-15, is drilling at 2,210 feet. Standard Oil Co. has begun drilling No. 16 J. J. Hart, a new location, 625 feet south and 150 feet west NE cor. Section 34-21-16.

DeSoto Parish

American Controlled Oil Co. is drilling 6⅝-inch plug at 2,688 feet on No. 2 Lanier, Section 5-11-11.

Monroe District

Morehouse Parish: Charles Bennett has derrick up for No. 1 Davis, 660 feet north and 274 feet west SE cor. Section 21-20-4. Consolidated Carbon Co. is drilling No. 1 Perry, Section 14-20-4, at 620 feet. C. S. Jordan's No. 1 Southern Carbon Co. is a location 10,185 feet west and 1,980 feet south NE cor. Section 13 in Section 14-20-4.

Ouachita Parish: Imperial Oil & Gas Products Co. is drilling at 1,950 feet on No. 3 Stubbs, Section 13-19-3. Jordan Drilling Co.'s No. 1 Slagle is a derrick 400 feet west and 569 feet northwest of the corner of Section 47 in Section 48-18-4. Ouachita Natural Gas Co. is drilling No. 2-A D'Arbonne, Section 34-19-3, at 2,205 feet and No. 7 Smith, Section 38-20-4, has 6-inch casing cemented at 2,091 feet. Palmer Corp. has begun drilling No. 1 West Virginia Timber Co. in Section 5-18-4. Southern Carbon Co.'s No. 8 Fairbanks, Section 38-19-4, is drilling at 2,115 feet. United Carbon Co. has set 191 feet of 12½-inch casing in No. 2 Nelson fee, Section 6-19-5, and is drilling at 795 feet. West Virginia Oil & Gas Co. is drilling No. 5 fee, Section 5-18-4, at 1,920 feet.

Union Parish: Sarter & Goodwin, after swabbing salt water with a little oil at 2,247 feet, shut down No. 1 Security Trust, in Section 7-23-1e. Later they decided to deepen the hole and after drilling to 2,254 feet, swabbed again with the same results. John Potts, trustee, has derrick up for No. 1 Bernstein in Section 30-20-4.

Red River Parish

J. H. Askew's No. 2 Richardson in Section 25-15-11 is drilling at 2,508 feet. He began drilling No. 3 Richardson in the same section December 8, set 100 feet of 10-inch surface casing and is drilling at 850 feet.

Richland Parish

Gulf Refining Co.'s No. 1 Millsaps, in Section 8-17-6, north of production, is in hard shale at 2,306 feet. Moody & Seagraves are rigging up to drill No. 1 Hatch, Section 34-16-5; No. 2-B Hemler, Section 6-15-6, is drilling at 2,214 feet; No. 1 LaFleur, Section 18-16-6, is a derrick and No. 1 McClanahan in Section 36-16-5, is shut down waiting orders at 2,435 feet. No. 1 Noble, Section 36-16-5, has 6-inch casing cemented at 2,276 feet and No. 1 Osborn, in Section 14-15-5, is drilling at 1,935 feet.

Natural Gas & Fuel Corp. is drilling 6⅝-inch plug at 2,282 feet in No. 1-A Sartor, Section 9-16-6, and No. 1 Sartor & Phillips is a location 1,320 feet south and 640 feet east NW cor. E half SW Section 9-16-6. No. 1-A Thompson, in Section 21-16-6, is rigged up ready to drill.

Noe & Meredith have made location for No. 1 Boughton, 1,980 feet east and 660 feet north SW cor. NW Section 4-15-6, their first test in Richland. Roxana Petroleum Co. is arranging to abandon No. 2 Tensas Delta Land Co. in Section 1-14-5, after drilling 2,637 feet. Ruston Drilling Co. is rigging up to drill No. 1 Sartor, 1,520 feet east and 700 feet north SW cor. Section 17-16-6. Southern Carbon Co. is drilling No. 1 Sartor, Section 20-18-8, at 2,040 feet; No. 2 Sartor, Section 26-16-6, is a derrick and derrick is up on No. 3 Sartor, a new location 660 feet north and west SE cor. SW Section 18-16-6. Stovall Drilling Co. is down 1,890 feet with No. 1 Dunning, Section 26-16-6.

Sabine Parish

Pleasant Hill: Arkansas Fuel Co. has perforated casing at 2,100 feet in No. 1-A Logan and is waiting on standard rig, total depth 4,258 feet. Seip and others are drilling No. 1 Moore, Section 33-10-12, at 1,650 feet.

Webster Parish

Cotton Valley: Humble Oil & Refining Co. is arranging to set a string of 11¾-inch casing at 2,810 feet in No. 5 J. Babb, Section 14-21-10, and is drilling No. 1 M. E. Gray, Section 26-21-10, at 3,787 feet. Magnolia Petroleum Co.'s No. 1 G. W. Cole, Section 27-21-10, is drilling at 3,551 feet; No. 5 Marshall, Section 21-21-10, is coring at 2,530 feet and No. 1 J. M. Mixon, in Section 22-21-10, is drilling at 1,645 feet. Ohio Oil Co.'s No. 1 Holloway, in Section 23-21-10, is drilling lime at 4,537 feet.

Sarepta, Spring Hill and Shongaloo: Arkansas Natural Gas Co. has set 475 feet of 10-inch surface casing in No. 1 North Central Texas, Section 36-23-10, and is drilling at 550 feet. Magnolia Petroleum Co. has rig up to drill No. 1 Munn, Section 29-23-9; No. 1 Newsom, Section 32-23-9, is coring at 2,634 feet and No. 1 W. B. Roseberry, Section 29-23-9, is drilling shale at 1,205 feet. Northwest Louisiana Gas Co. cemented 6-inch casing at 2,681 feet in No. 1 Munn, Section 29-23-9

ARKANSAS

Ouachita County

Smackover: Humble Oil & Refining Co. tested dry with no show in 3 feet of sand at 2,579-82 feet in deepening No. 4 Murphy, Section 3-16-15, and is drilling at 2,596 feet. Phillips Petroleum Co. got salt water at 2,696 feet in deepening No. 19 Joyce, Section 33-15-15, and is arranging to whipstock at 2,650 feet. Standard Oil Co., deepening No. 5 Umstead in Section 32-15-15, has cemented 4½-inch casing at 2,657 feet.

Union County

El Dorado: C. H. Allison began drilling No. 10 Fitzgerald, CWL NE SW Section 17-18-15, December 10 and has set 10-inch casing at 202 feet.

El Dorado East Field: Grimes Brothers are drilling No. 9 Van Hook, Section 7-18-14, at 1,650 feet; No. 1 Williams, Section 8-18-14, has been standardized and is pumping from 10 feet of sand at 2,229-30 feet but has had no gauge.

Champagnolle: Eddie Jones' No. 2 Crain, Section 2-17-14, is drilling at 2,310 feet; No. 3 began drilling December 10 and set 151 feet of 10-inch casing, and No. 4 is rigging up. Ohio Oil Co.'s No. 3 Crain, Section 1-17-14, is standing with 1,800 feet of oil in the hole from 8 feet of sand at 2,988-96 feet, but will not flow; No. 5 is drilling 6⅝-inch plug at 3,044 feet; No. 6 set 10-inch casing at 324 feet and is drilling at 1,366 feet and No. 7, which began drillinng December 8, has set 10-inch casing at 205 feet. No. 1 R. H. F. Goode, Section 2-17-14, began drilling December 9 and has 161 feet of 10-inch casing set for surface string; No. 2 Goode began drilling December 7, set 10-inch casing at 282 feet and is drilling at 800 feet. No. 1 R. Pumphrey, Section 1-17-14, cemented 6⅝-inch casing at 3,010 feet. No. 2 R. Pumphrey, in Section 2-17-14, is drilling at 1,643 feet; No. 3 began drilling December 6, set 10-inch casing at 158 feet and is drilling at 685 feet; No. 1 Pumphrey, Section 1-17-14, bailed dry in 6 feet of sand from 2,994-3,000 feet and is setting liner to test 5 feet of broken sand at 3,012-17 feet.

Smackover: Lion Oil & Refining Co. has rig up to drill No. 1 Leverett, a new location 330 feet north and west SE cor. NE Section 11-16-16, and is arranging to plug back and perforate No. 7-B Murphy, Section 8-16-15, completed March 27 this year as a 7,000,000-foot gasser at 2,768 feet, total depth 2,806 feet. Magnolia Petroleum Co. cemented 6⅝-inch casing in No. 1 Wilson, Section 17-16-15, at 2,480 feet. E. N. Wood, trustee, has taken over Thurman and others' old No. 2 Houston in Section 12-16-16, completed April 16, 1926, pumping 80 bbls. oil at 2,558 feet, and is arranging to test 3 feet of sand at 2,730-33 feet.

EAST TEXAS

Harrison County

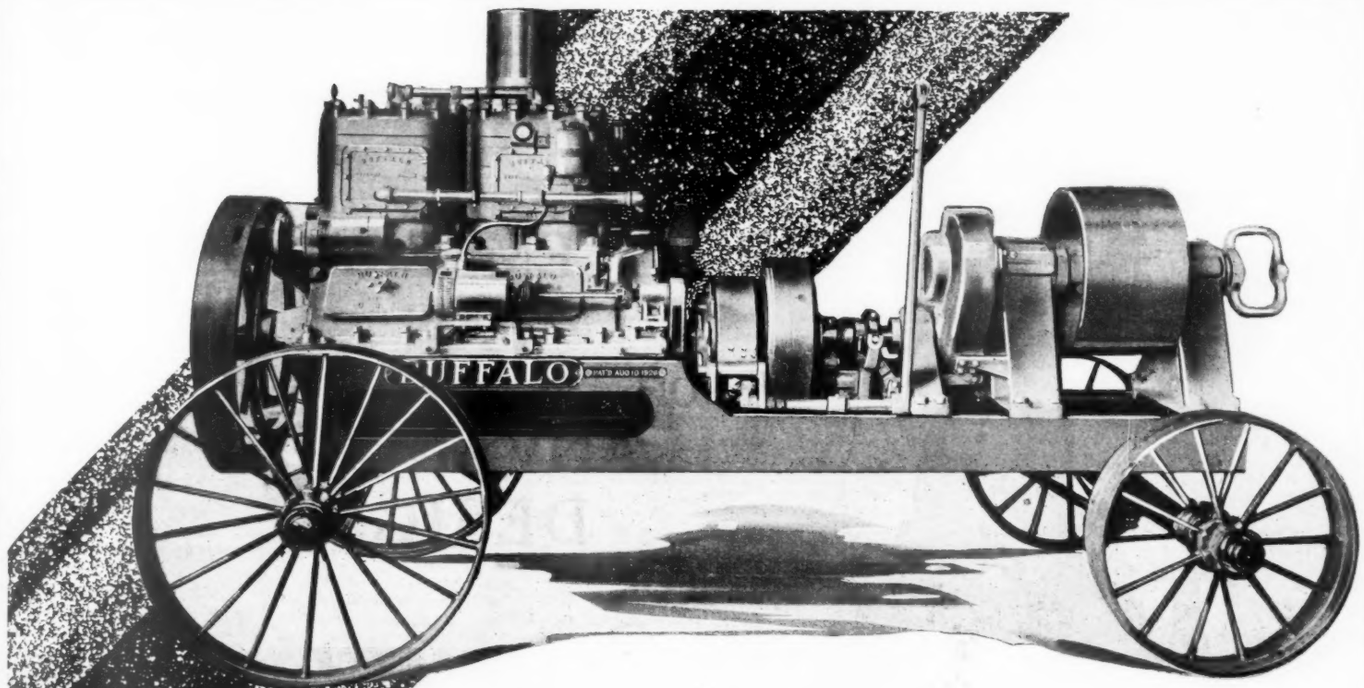
Waskom: Doney and others' No. 1 Furrh, Joel Lipscomb Survey, is drilling 6-inch plug at 986 feet. Ferguson and others began drilling No. 1 C. M. Abney, a new location on the G. W. Martin Survey, November 28, set 105 feet of 10-inch surface casing and 6-inch casing at 785 feet. State Line Oil & Gas Co.'s No. 5 C. M. Abney on the E. Little Survey, is drilling red shale at 2,890 feet. Tylong Oil & Gas Co. has made location for No. 3 Vaughn on the W. R. Anderson Survey and has rig up.

Marion County

Lumbermen's Oil Co. (Holmes and others) is drilling No. 1 Bonham in the Robert Potter Survey, at 1,500 feet.

Panola County

Bethany Oil & Gas Co. is rigging up on No. 4 Burns in the W. A. Birdsong Survey. S. H. Gardner and others began drilling No. 1 Roquemore on the B. C. Jordan Survey December 1, set 100 feet of 10-inch casing and has 6-inch set at 2,200 feet. Magnolia Petroleum Co. is bailing 6-inch casing cemented at 2,303 feet in No. 1 Lila Fletcher, B. C. Jordan Survey, and is rigging up on No. 1 Jernigan & Estes, 1,097 feet south and 1435 feet west NE cor. Benson Lovell Survey. The same company has rig up on No. 13 C. G. Ssteele, 1,556 feet south and 612 feet west NE cor. C. G. Steele 160 acres, in B. C. Jordan Survey; No. 1 J. M. Trosper in the James Shadoin Survey is arranging to set 4½-inch casing at 2,416 feet, and No. 3 J. M. Trosper is a derrick 700 feet north and 600 feet east NE cor. Jane Thorpe Survey in James Shadoin Survey.



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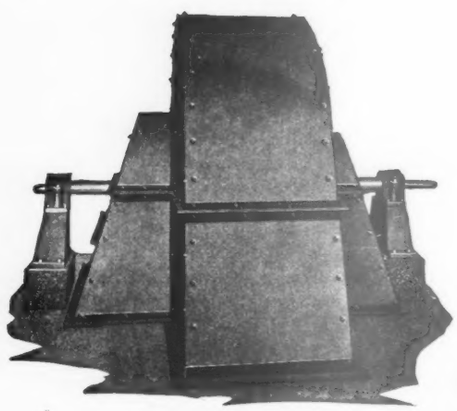

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THREE NEW OPERATIONS IN EAST CENTRAL TEXAS

MEXIA, Tex., Dec. 17. — Two dry holes and three new operations started comprised the record of the East Central Texas fields in the past week.

The Humble Oil & Refining Co. abandoned its No. 1 T. H. Jones, Roberts Survey in Anderson County, at a total depth of 3,650 feet. In the same county, the Humble company has made location for a test on the Felix and Smith land on the Roberts Survey. The same company's No. 3 Spencer Clemmons, Benson Survey, was drilling in shale at 3,909 feet.

In Limestone County, the Transcontinental Oil Co. has rotary rigged up on No. 1 R. P. Ward, in the Cedar Creek area. In the same county, C. W. Harrison and others were drilling in shale and boulders at 2,150 feet. Reiter, Hicks & Hoover have abandoned their No. 1 Val De Long, Varella Survey, at 3,105 feet.

In Navarro County, where there has been no drilling for some time, DeArmond Brothers have derrick up for a wildcat test on the Murphy farm, Taylor Survey, about 3½ miles northwest of Richland.

CALIFORNIA FIELDS

(Continued from Page 48)

lease and both should result in favorable production. The only work of any consequence under way in the Inglewood Field is the attempt of the Brownmoor Oil Co. to develop deep sand production out along the northern edge. The property under development is not very advantageously located but the company's work will nevertheless be watched with considerable interest because if the attempt is successful it may result in the drilling of several offsets. The Brownmoor selected No. 8 as its deep test and a string of 8⅝-inch will be run in and landed at approximately 3,275 feet. Core samples indicate that the deep sand has actually been encountered but its potentiality will not be determined until an actual test has been consummated. There were no particular developments of interest in either the Dominguez or Torrance fields during the current week, although there is a possibility of one completion in each district within the next week or 10 days. The Chanslor-Canfield Midway Oil Co. is putting the finishing touches on No. 71 Torrance in the latter area and upon completion the crew will be shifted over to No. 91 for immediate work. The Shell ran a water switch in No. 12 Slusher, a recent completion in the Santa Fe Springs Field and the test showed evidences of bottom water. The well has accordingly been plugged back to 4,575 feet and it will make another bid for production in the near future.

Kern River

Two new wells were finished in the Kern River Field during the current week and a check of operations under way at the present time indicates the probable completion of additional new wells during the next 30 days. The St. Helens Petroleum Co. successfully finished its second commercial producer out along the west front in Section 26-28-27, and this new well, like the original completion, registered substantial production. It came in doing 428 bbls. of 15.1 gravity oil daily from 2,275 feet, the hole having been finished with a 6¼-inch perforated liner. Simultaneous with the completion of this project the company started pouring concrete foundations for six new wells and rigs construction will probably get under way shortly as material is now being moved in. The company's next producer in this area should be No. 3 in Section 26-28-27, which recently passed the 1,715-foot level with less than 550 feet to go. The Standard finished No. 12 in Section 27-28-27, but it only registered small production due probably to the fact that bottom water has been encountered. This well was originally drilled to 2,529 feet but later plugged back to 2,438 feet because of a gray sand which looked rather threatening. It proved to be water bearing and an additional plug will probably be required as the daily output, 110 bbls., is cutting something like 30 per cent water. The Standard's next completion in this district should be No. 18 in Section 15-28-27, as the top of the oil sand was picked up a few days ago at 2,015 feet. Whittier & Kent should also add a new producer in the near future as their No. 1 in Section 26-28-27, is located in proven territory and destined to pick up the sand within the next day or two.

Northern California Wildcats

Prospecting work throughout the San Joaquin Valley gives evidence of resulting in the discovery of another field or two within the next six months and operators should watch this area very closely for future production. With the Mon Bluff area proven up for production a few days ago and thus removed from wildcat lists, the industry will undoubtedly watch developments in the Fruitvale, Union Avenue and Edison sections very carefully from now on. Ventura County is also showing increased wildcatting although there are several tests under way in that section which do not look particularly promising at the present time. The Standard, with several thousand acres under lease, recently spudded in the first well of a series of structure survey tests which will form the basis for a deep wildcat in the Saticoy region if developments warrant. The Shell will probably follow a similar procedure around Oxnard, where the company holds approximately 20,000 acres under lease. The Shell is pretty well sold on the possibilities of Ventura County and this is evidenced by the fact that in addition to its huge leaseholds the company has two deep wells actually under way, one at Moorpark and another near Strathern. The Union is not prospecting at any point in Ventura County at the present time but is concentrating in San Luis Obispo County where it will spud in No. 1 Huasna in the very near future.

Southern California Wildcats

Operators are still wondering whether to classify the Potrero district as a new field or put it back on the wildcat list due to the fact that the Associated's discovery, No. 1 Cypress, has encountered water trouble in both the upper and lower horizons. It is the writer's opinion that the Associated will subsequently develop favorable production as the present test is not any too favorably located. The company incidentally contemplates a second well to be drilled about 700 feet west of No. 1 Cypress and this location should be a good criterion as to what the future of this field will be. Two new wildcats were started this week, one at Sunset Beach and another near Lynwood. The Olympic Refining Co. started rig construction in the former area, which is located between Seal Beach and Huntington Beach, while the Security Petroleum Corp. has a steel rig going up near Lynwood, about 2 miles away from a test drilled by the Magnolia Oil Co. at Maywood. The White Behr Oil Co. reports a favorable showing in its Watson wildcat, south of the Dominguez Field, at 3,795 feet and coring will be more frequent from now on.

CANADIAN FIELDS

(Continued from Page 45)

sand wells give McLeod No. 3, 40 bbls.; New McDougall-Segur No. 1, 45 bbls.; New McDougall-Segur No. 2, 80 bbls., an aggregate of 165 bbls. a day from the three wells. Home Oil Co's No. 1 with an estimated production of 100 bbls. a day, part light crude and part crude naphtha, is not yet in regular production, while Dalhousie Oil Co.'s No. 5, with 250 bbls. a day estimated light crude production, will not be brought into regular production till the Madison limestone has been tested by deeper drilling.

The deep production should be supplemented within the next few months through the completion of a number of producers now drilling in or near the Madison limestone. These include British Dominion, LSD 4, Section 5-20-2w5, now at 6,080 feet; Calmont Oills, LSD 2, Section 1-20-3w5, close to 4,300 feet; Dalhousie Oil Co.'s No. 1, LSD 4, Section 18-20-2w5, in the Madison at 4,357 feet; Dalhousie No. 5, LSD 16, Section 30-19-2w5, in the Madison at 4,702 feet; Dalhousie No. 6, LSD 10, Section 13-20-3w5, down around 4,517 feet; Okalta Oils' No. 1, LSD 1, Section 1-20-3w5, at 4,320 feet or more; Spooner Oils' No. 1, LSD 12, Section 13-20-3w5, at 4,810 feet, and Vulcan Oils' No. 2, LSD 11, Section 13-20-3w5, now below 4,000 feet. One or two of these tests may get production before the end of December, if weather conditions do not interfere with drilling.

In the border fields, southern Alberta, Gas Production & Transportation No. 1, NE Section 21-4-18w4, near Warner, which recently resumed drilling after a fire which destroyed the derrick, caught fire again a few days ago from escaping gas. The men were able to extinguish the fire before serious damage was done. In the Canadian Natural Gas Co's drilling camp at Barnwell a new diamond driling outfit was badly damaged by fire, and some frame structures were destroyed.

In the Pincher Creek district, southwestern Alberta, Mount Royal Oil & Gas Co.'s No. 1, LSD 4, Section 7-6-1w5, has resumed drilling around 1,000 feet after a shut down due to bad weather.

Ontario Fields

In Kent County, Ontario, Union Natural Gas Co.'s No. 279, Shanks farm, Romney Township, was just ready to spud in when the rig blew down in a stiff gale. The test is again being rigged up. No. 278, Radmor farm, Romney Township, is reported drilling around 300 feet.

In Dawn Township, Lambton County, Union Natural Gas Co.'s No. 20 is reported drilling around 1,800 feet without a show, and looks like a dry hole.

In Dover Township, Kent County, Ajax Oil & Gas Co.'s deep test on the Reaume farm, close to Union Natural Gas Co.'s No. 1 producer, is reported down about 2,200 feet and running the 6⅝-inch casing. The outfit is running double tour, and is reported to be making between 75 and 100 feet a day. Production is looked for in the Trenton limestone at 3,065 feet. The Ajax well is about 375 feet from Union's No 1, which produced both oil and gas from the Trenton limestone.

In Wellington County, the F. L. Snively deep test on the Alex Naubauer farm, Puslinch Township, has resumed drilling, after a six week's delay resulting from the wrecking of the derrick by a high wind. It is reported that drilling resumed at 1,960 feet depth.

GULF COAST FIELDS

(Continued from Page 43)

surface casing. Rycade is the only operator at Nash Dome.

Hardin County

Adabel Oil Co.'s No. 117 McGoldrick at Batson, Hardin County, is drilling around 1,000 feet. Capitol Oil Co., in the same district, is preparing for a test around 4,000 feet and has set strainer. Deutser Oil Co.'s No. 1 Colorado-Batson Syndicate, is drilling around 1,125 feet.

A little more activity also is been shown at Saratoga in Hardin County. Gulf Production Co. is drilling at 893 feet in its No. 13 Tabor, a former shallow well. Regna Oil Co.'s No. 2 Teel is drilling around 1,410 feet and Rio Bravo Oil Co.'s No 104 "D" around 1,900 feet. Sun Oil Co. is drilling ahead in its 137 M. & M. and is down around 2,150 feet.

At Sour Lake, Gulf Production Co. has a rig up for No. 3 Thomson and associates. Orange Petroleum Co.'s No. 4 Merchant at Sour Lake is drilling below 4,375 feet.

Harris County

Rio Bravo Oil Co.'s No. 1 P. S. A. at Pierce Junction, just south of Houston, is flowing approximately 1,800 bbls. daily from a sand at a total depth of 4,375 feet. Another well completed at Pierce Junction during the week turned out only an 85-bbl pumper at 3,560 feet. This was Joe Bashara's No. 2 Higgins. Both are old wells worked over and deepened.

Rio Bravo Oil Co.'s No. 7 P. S. A., at Pierce Junction, which was reported a week ago as flowing 250 bbls. of fluid at 3,720 feet, is being deepened and now is down below 3,765 feet. This company's No. 101 G. H. & S. A. is drilling below 4,410 feet, while a rig is up for No. 7-B on this company's Settegast lease.

Anderson & Plummer's No. 2 Whitehead at Pierce Junction is drilling at 1,580 feet. Cullen and associates' No 4 Howe is down 2,265 feet. Gulf Production Co.'s No. 1 Perry is drilling at 5,113 feet, its No. 22 Taylor at 4,484 feet and its No. 23 Taylor at 2,153 feet. Hute Oil Co. is down 2,765 feet in No. 1 Traper. Leonard Petroleum Co. is planning to put its No. 1 Marland fee on the pump for a sand at 4,612 feet.

Three new tests also are to be started at Pierce Junction by Moody-Seagraves, these being No. 3 Hume (Reid), No. 2 Whitehead and No. 1 Cooper. No. 2-B Cain, formerly known as No. 4, is drilling at 1,625 feet. Sun Oil Co. also is bailing for a test of a sand at 4,490 feet in No. 1 Fitzsimmons.

A new test is to be drilled at Humble, also in Harris County. This will be No. 1 Hirsch, for which a location has been staked. Very little new work has been started in this district for a long time. At Hockley, Humble Oil & Refining Co.'s No. 2 Warren is drilling gumbo and lime at 3,029 feet.

At Goose Creek, Humble Oil & Refining Co.'s No. 73 Simms-Smith is drilling soft shale and sand at 3,897 feet. No. 4 Ashbel-Smith is being washed at 2,495 feet. Humble still is having some trouble in cleaning out the hole of No. 10 Sweet, which is to be worked over and deepened. Saturday it was fishing liner at 2,626 feet. Gulf Production Co.'s No. 18 Hoffman-Gaillard at Goose Creek is drilling at 2,265 feet. The latter's No. a1-A Wright is fishing liner. Lube Well Oil Co. has a new operation at Goose Creek, No. 1 Dannenbaum, which already has reach a total depth of below 1,600 feet. Powell Oil Co. has what looks like a pumper in No. 6 Bryan and the well is to be put on the beam.

Jefferson County

At Spindletop, Turnbow's No. 2 Banks has been abandoned at 4,250 feet. The test has been shut down several months at that depth with the drill stem stuck. Gulf Production Co.'s No. 10-A Marrs-McLean is drilling around 5,194 feet and No. 9 Daisy Roche at 4,276 feet. This company set strainer for a test of a formation at 4,873 feet in No. 6 Jack & Duff but failed to make a well so now is fishing strainer to drill deeper. Gulf has a rig up for No. 7 Jack & Duff. Its No. 17-A Marrs McLean is drilling at 2,178 feet and its No. 18-A on the same lease at 1,370 feet. Magnolia Petroleum Co. is setting casing in No. 7 fee. This hole has reached the 4,800-foot level. Paggi Brothers have a rig up for No. 1 Gordon. Rio Bravo Oil Co. is drilling at 3,435 feet in No. 2 T. & N. O. while Sun Oil Co. is down below 5,700 feet in its No. 6 McLean. The latter company's No. 11 McLean is drilling around 3,100 feet and No. 18 at 2,340 feet.

Liberty County

Humble Oil & Refining Co. has added another small pumper in the South Dayton Field in its No. 5 Welder, an old well worked over. This well now is producing around 75 bbls. daily. D. J. Harrison's No. 2 Jones, North Dayton, another old well being deepened, is drilling below 2,325 feet.

At Hull, W. F. Flynn is making arrangements to deepen his No. 1 Ray. Gulf Production Co's No. 43 Phoenix, also an old well, is drilling deeper at 3,144 feet. Gulf's No. 87 Phoenix is drilling at 4,848 feet, and No. 11 Thomas fee, the latter a workover, at 3,672 feet. Humble Oil & Refining Co. is preparing to work over one of its old Hull wells, the No. 10 Hooks-Bell. Humble's No. 21 Guedry has been put on the beam making 50 bbls. daily. Republic Production Co. also got a well at Hull, its No. 49 Dolbear, which is flowing approximately 200 bbls. from sand at 3,025 feet. Hull Oil Co. rigged up to put No. 7 Harrison

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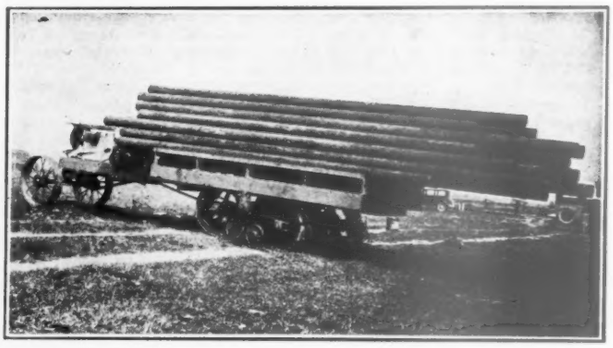

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on the pump but the screen sanded up and the well has not been completed. Hull Oil Co.'s No. 4 Harrison also is to be worked over and deepened, as is Republic Production Co.'s No. 39 Dolbear. The Texas Company is drilling at 3,060 feet in its No. 2 Hannah fee at Hull, while The Texas Company's No. 7 Hannah, the latter being drilled jointly by the Vacuum Oil Co., is drilling in rock at 2,606 feet.

In the Liberty Field, Yount Lee Oil Co. is rigging up for No. 1 Mitchell, a new operation. This is in the M. G. White Survey, 50 feet from the south line and 50 feet from the west line of the 50-acre tract.

Matagorda County

At Markham, Rycade Oil Corp. and Humble Oil & Refining Co.'s No. 5 Kountze is down 3,882 feet, but has been shut down temporarily for several days because of high winds blowing gas on the boilers.

Orange County

Gulf Production Co. got two wells at Orange during the week, both of which were old wells worked over and deepened. No. 2 Lee Hager fee is flowing 760 bbls., 24 per cent salt water and sediment, and No. 1 Hager & Moore is flowing 496 bbls., 90 per cent salt water. The former is producing from sand at 4,185 feet and the latter at 3,609 feet. Gulf has a rig up to deepen No. 7 Hager & Moore. Humble Oil & Refining Co. is milling at 2,962 feet. Rex Petroleum Co. has started deepening its No. 6 Carbello. Rycade Oil Corp.'s No. 13-E State cored a salt water sand at 4,590 feet. Sinclair Oil & Gas Co. is drilling at 3,105 feet in No. 4 Granger. Sun Oil Co.'s No. 2 Brown is down below 4,500 feet.

Washington County

In addition to Brenham operations previously mentioned, three shallow tests have been abandoned in Washington County, these being Sun Oil Co.'s Nos. 1, 2 and 3 Freeman, depths ranging from 942 feet to 1,220 feet.

Wharton County

Gulf Production Co.'s No. 1 Abendroth at Boling has been completed pumping 140 bbls. daily from a sand at 1,512 feet. Hyde Production Co.'s No. 5 Woytek also has been completed making 120 bbls. from a shallower sand at 428-31 feet. Two other shallow tests, both drilled by the Texas Gulf Sulphur Co. for sulphur, were abandoned, these being No. 1 Volney and No. 1 Werner.

Benson & Abercrombie have made locations at Boling for two more shallow tests, Nos. 3 and 4 Waytek. Hyde Production Co. also has a new location for No. 6 Waytek, the Texas Gulf Sulphur Co. one for No. 11 Bay and one for No. 1 Cloud, and the Weed-Gayle Oil Co. one for No. 9 Bat. Gulf Production Co.'s No. 3 Adendroth is drilling at 1,437 feet and No. 8 Chase at 1,040 feet.

LOUISIANA GULF COAST

Acadia Parish

In the Evangeline Field, Port City Oil Co. has completed No. 8 S. F. S. pumping 75 bbls., 10 per cent salt water and sediment, from a sand at 1,772 feet. Coastal Oil & Refining Co.'s No. 95 Crowley, which has been shut down several months with drill stem stuck, has been abandoned at 2,555 feet. Cline and associates' No. 6 Conklin also has been abandoned after drilling to 2,175 feet. The latter operators are preparing to deepen their No. 1 Wilson as is Port City Oil Co. its No. 6 S. F. S. Jennings Oil Co. has a new location for No. 1 fee. Salt Dome Oil Co.'s No. 1 Cruse (Valle Arpent) has set casing at 1,645 feet to test 10 feet of sand. The Texas Company's No. 106 Latrielle is drilling below 2,115 feet. The latter company has set 3,540 feet of 8⅝-inch casing in No 2 Rayne heirs. Total depth of the hole is 3,560 feet.

Calcasieu Parish

Drysdale-Savoy Oil Co.'s No. 2 Hill at Edgerly has been completed pumping 150 bbls. from sand at 3,120 feet. C. M. Crotty's No. 7 Lillard, which was reported a week ago as flowing at the rate of 10 bbls. daily from 2,220 feet, is drilling deeper and is down below 2,240 feet. Edgerly Petroleum Co. is making arrangements to deepen No. 11 Vincent. Green Oil Co. has a derrick up for No. 9 Moore. Rex Petroleum Co. is sidetracking up for No. 9 Moore. Rex Petroleum Co. is sidetracking at 2,910 feet in No. 1 Ecker. Wilson-Broach have a rig up to deepen their No. 6 Wilson.

At Starks Dome, Gulf Refining Co.'s No. 7 Lutcher-Moore tested salt water at 5,212 feet and is being drilled deeper. At Lockport, near Lake Charles, Vacuum Oil Co. and Gulf Refining Co.'s No. 19 Miller is drilling gumbo at 2,916 feet. These operators have connected up a blow-out preventer on their No. 3 Farquahar and Saturday had started in the hole to pull the sleeve off the screen. The test is in a sand at 4,399 feet. No. 3-A is in a sandy shale at 4,357 feet. This test encountered a slight showing of oil in a sandy shale at 4,331-44 feet. No. 5 Farquahar is down 5,667 feet but has been shut down temporarily for minor repairs. No. 4 Bayou d'Inde State has encountered a sand showing oil at 4,410-11 feet. No. A-1 fee is drilling sandy shale at 3,938 feet, while No. 2 Frieber & Wolf is in shale at 5,910 feet.

At Vinton, Vinton Petroleum Co. has set strainer at 2,775 feet in No. 9 Gordon. This company's No. 48 Gray is being bailed at 2,830 feet.

Cameron Parish

Pure Oil Co. has completed No. 3 Sweet Lake at Sweet Lake flowing 500 bbls. of 29.9 gravity oil daily through a quarter-inch choke. Production is from a sand at 5,897 feet. Louisiana Land & Exploration Co.'s No. A-1 Calcasieu Lake is down 903 feet where 9¼-inch casing has been cemented. Pure Oil Co. is drilling gumbo at 5,175 feet in its No. 4 Sweet Lake. No. 2 Sweet Lake, which encountered salt water, is standing.

Operations in the East Hackberry district were routine with three tests, previously reported as locations, getting ready to start actual drilling operations. These are C. O. Noble and associates' No. 1 Ellender, Calcasieu Oil Co.'s No. 1 Watkins and Yount Lee Oil Co.'s No. 6 State Calcasieu Oil Co.'s No. 1 Oliver is drilling ahead and at last reports was around 2,100 feet. Yount Lee Oil Co.'s No. 7 School Land, in the old Hackberry district, 3 miles to the west, also is getting ready to start drilling.

Miscellaneous

Tom Hincy and associates' No. 1 Ducide Guillery at Pine Prairie Dome, Evangeline Parish, was in a rock formation at 2,265 feet. Gulf Refining Co.'s No. 1 Broussard, at Fauusa Point, Iberia Parish, is drilling at 4,641 feet. In the same district, Gulf's No. 3-Z State is down 2,176 feet. Louisiana Land & Exploration Co.'s No. 1-A Vermilion Bay, Iberia Parish, has been drilling shaley gumbo below 400 feet. Roxana Petroleum Corp.'s No. 1 Wilbert, White Castle, Iberville Parish, has set 653 feet of 12½-inch casing. The hole is at a total depth of 1,054 feet. Union Sulphur Co. is starting drilling on its two tests in this parish, No. 1 Wilbert on the Bayou des Glais Dome and No. 1 Schwing on the Bayou Blue Dome. Eunice-Welch Oil Co. has a location for a test on the Chacahoula Dome, LeFourche Parish. Gulf Refining Co. is getting ready to start drilling in its No. 2 Stark and associates on this dome. Rycade Oil Corp. was preparing Saturday to run a cutter on the 6⅝-inch casing to cut out the 4-inch drill pipe at No. 1 Atchafalaya, St. Martin Parish. This test is down 3,916 feet. Rycade also is hauling drilling mud to start operations in its No. 2 on this dome. Louisiana Exploration Co. has abandoned No. 1 Blanche, St. Maty's Parish. Southern Gas Co. is cutting and pulling liner at 2,702 feet in No. 3 South Dome, Terre Bonne Parish

KANSAS FIELDS

(Continued from Page 36)

the rig for No. 4 Schwab, NW cor. SW NW, Section 30-22-13. Murphy and others' rig is on the ground for No. 6 Green, NW cor. NE NW, Section 14-23-9. Lassen and others have the rig up for No. 3 Wilkerson, SE cor. SW, Section 6-25-9. Empire Oil & Refining Co. has a machine at the location for

No. 1 Webber, SE cor. NW SW, Section 10-25-13.

Darby Petroleum Co.'s No. 5 Fankhouser, SW cor. Section 24-22-12, had sand at 1,610-56 feet, drilled to 1,666 feet and made 250 bbls. after a shot of 220 quarts. Darby Oil Co.'s No. 2 Schwab, NE cor. SW NW NW, Section 30-22-13, was completed for 280 bbls. in sand at 1,690-1,737 feet, total depth 1,740 feet. No. 3 Schwab, NW cor. SE NW NW, Section 30-22-13, made 300 bbls. from sand at 1,687-1,737 feet. Featherline and others' No. 1 Jenkins, NE cor. NW NW, Section 30-22-13, is a 10-bbl. well after shooting 160 quarts in sand at 1,665-1,722 feet. Murphy and others' No. 5 Green, NE cor. NW NW, Section 14-23-9, made 125 bbls. from sand at 2,292-2,332 feet. Valley-Osage Oil Co.'s No. 1 Roglin, SW cor. SE, Section 10-25-13, made 100 bbls. from sand at 1,420-48 feet. Foster Oil Co.'s No. 1 Taylor, NE cor. NW, Section 7-27-12, had sand at 2,125-35 feet and plugged back to 1,862 feet and abandoned.

Osborn County

Liggett and others' No. 2 Worley, NE cor. SE NW, Section 34-10-15w, is a rig under construction.

Russell County

Wilcox Oil & Gas Co. has the rig up for No. 4 Munsell, SW cor. Section 17-12-15w.

Sumner County

Roxana Petroleum Corp.'s No. 4 Emerich "A," NW cor. SW SE Section 14-32-2e, is a location. Wasson and others made location for No. 2 Gassoway, SE cor. SW, Section 14-32-2e. The Prairie Oil & Gas Co. located No. 3 Olson, SW cor. NW NE, Section 3-35-2e.

Roxana Petroleum Corp.'s No. 5 Wiles, NW cor. NE, Section 25-21-2e, made 300 bbls. after sand at 1,850-1,904 feet was shot with 50 quarts. No. 3 Wenrich, NE cor. SE NE NW, Section 36-31-2e, made 500 bbls. from sand at 1,846-93 feet.

OKLAHOMA FIELDS

(Continued from Page 36)

SW, Section 21-18-7, was completed for 3 bbls. in sand at 868-89 feet. George S. Bentley's No. 1 Cowhart, NE cor. SE, Section 25-17-15, is a dry hole at 1,313 feet. Knox & Shouse's No. 1 Lumpkin, NE cor. SW NW, Section 10-17-16, has been abandoned at 706 feet.

Seminole County

Mid-Kansas Oil & Gas Co. is building the rig for No. 3 Wilkins, SW cor. NW NE, Section 25-9-6, Seminole Pool. T. Atkins has the cellar dug for No. 1 Grayson, SE cor. SW, Section 9-9 8. Roxana Petroleum Corp. and Papoose Oil Co's rig is on the ground for No. 1 Maines, NE cor. NW SW, Section 7-8-6, Bowlegs Pool. Pure Oil Co. has dug the cellar for No. 4 Strothers "F," SE cor. NE NW, Section 10-8-6. Roxana Petroleum Corp. made location for No. 1 Micco, SW cor. Section 32-8-7. The Texas Company made location for No. 1 Reed, NE cor. NW NE, Section 24-6-7.

The Texas Company's No. 7 Anderson, SW cor. SE, Section 2 9-5, Earlsboro Pool, made 575 bbls. from Wilcox sand, 4,270-78 feet. No. 7 Brown, SE cor. SW NW, Section 10-9-5, swabbed 100 bbls. from Wilcox sand at 4,380-84 feet after shooting 10 quarts Magnolia Petroleum Co.'s No. 9 Seay, SE cor. NW SW, Section 12-9-5, was completed for 137 bbls. from Wilcox sand at 4,280-94 feet. Barnsdall Oil Co.'s No. 1 Fife, NE cor. NW, Section 14-8-5, made 1,396 bbls. from Wilcox sand at 4,291-96 feet and was then pinched in. Gypsy Oil Co.'s No. 1 Harjoche, SE cor. SW NW, Section 10-8-6, Bowlegs Pool, made 1,347 bbls. from Wilcox sand at 4,195-4,219 feet.

Magnolia Petroleum Co.'s No. 1 Hammond, SE cor. NE, Section 10-8-6, topped Wilcox sand at 4,120 feet, had a lime break at 4,150-75 feet and drilled to 4,267 feet. Production was 284 bbls. Carter Oil Co 's No. 5 Fish, NW cor. SW, Section 36-8-6, Little River Pool, made 380 bbls. from Wilcox sand at 4,223-34 feet. No. 6 Fish, SW cor. NW, Section 36-8-6, was completed for 785 bbls. in Wilcox sand at 4,201-04 feet. Sinclair Oil & Gas Co.'s No. 1 Cosar, SW cor. NW NW, Section 36 8-6, flowed 2,105 bbls. from Wilcox sand at 4,378-85 feet. Tidal Oil Co.'s No. 3 House, NE cor. NW, Section 1-7-6, produced 927 bbls. from Wilcox sand at 4,125-34 feet.

Pottawatomie County

Independent Oil & Gas Co. and Darby Petroleum Co.'s rig is being built for No. 3 Standridge, SE cor. NW SW, Section 14-7-4, Pearson area. Magnolia Petroleum Co.'s No. 2 Robbins, SE cor. SW SE, Section 15-7-4, is a rig under construction. Continental Oil Co. made location for No. 4 Phillips, NW cor. NE SW, Section 19-7-4. Magnolia Petroleum Co. made location for No. 1 Shipman, SW cor. NW NE, Section 19-7-4. M. T. Smith and others' rig is being built for No. 1 Billington, NE cor. NW NE, Section 22-7-4.

ROCKY MOUNTAIN AREA

(Continued from Page 45)

31, in the Maljamar area of Eddy County, is being closely watched as it is now at a depth where the final results may become known at any time. It is less than half a mile west of No. 1 Robinson on the NE SW, Section 25-16-31, which was completed several months ago at 3,885 feet with an initial production of 8,000,000 feet of gas and 5½ bbls. of oil. No. 2 Robinson had some rainbow colors and a small show of gas at 3,861 feet, and is now drilling ahead at 3,-890 feet in gray lime with the prospects not so very encouraging. Of equal importance with No 2. Robinson in showing what may be found in the immediate vicinity of the gasser is the Pueblo Oil Co.'s No. 1 Gessert, NW NW, Section 1-17-31, approximately 1¼ miles south and a little west of No. 1 Robinson. This well encountered some gas at 3,-705 feet which blew the tools up the hole 30 feet where they lodged and bridged the hole. Since then efforts have been directed towards clearing the hole of obstructions, but so far this has not been successful, though the tools now are reported to be in a better position with chances for getting them out being more encouraging.

Aside from the operations around the Robinson gas well, the principal development in Eddy County, was the testing of the Getty Oil, Inc.'s No. 1 Hinkle, NE cor., Section 23-20-29, in the Twin Hills district, 10 miles southeast of the Artesia Pool. It was shut down at 1,-372 feet with hole full of oil from horizon topped at 1,365 feet until tankage could be erected for a test. On a swabbing test it made 75 bbls. in three days and in that time was swabbed down. R. D. Compton's No. 4 Mann, SW NW, Section 4-18-27, has recovered the underreamer lug which delayed the lowering of the 8¼-inch casing for a few days and underreaming has been resumed. Total depth is 1,350 feet. Ross & Grimm's No. 1 Daugherty, NE SW, Section 3-17-27, is drilling ahead again and is bottomed at 1,567 feet. It was shut down for a while at 1,555 feet where it was thought it might be abandoned, but it was decided to drill deeper. Levers & Carper's No. 5 State, Section 3-18-28, is shut down in brown lime at 2,-236 feet for boiler and engine trouble.

Lea County

In Lea County, Inglefield & Bridges' No. 1 State, Section 4-17-34, is preparing to shoot the hole at 4,710-53 feet. The bailer was lost in the hole above the oil horizon, and this will be driven below the show. The 6¼-inch casing has been pulled and plug taken out. The test was drilled to 5,329 feet, where it had some salt water in a horizon topped at 5,313 feet. This is considered a final effort to make the test a producer before abandoning it. Henderson, Dexter & Blair's No. 1 Wyatt, SW SW, Section 34-17-33, which has been down for some time at 5,370 feet, will be given a shot, and if it does not make a better showing, will be abandoned. Maljamar Oil & Gas Co.'s No. 2 Beardsley, SE NE, Section 15-17-32, had a good showing at 3,890-93 feet, the oil rising 1,500 feet. A swabbing test indicated that it might make 20 bbls. a day. It has resumed drilling and is bottomed at 3,920 feet with several

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Gas Line from Maljamar?

Officials of the Maljamar company are reported to be in El Paso looking into the feasibility of constructing a pipe line from the Maljamar area to El Paso. The El Paso Gas Co. is the local distributor in that city and it is understood that company is willing to consider the purchase of gas if it is delivered at the city's limits, but that the promoters and not the company, will have to build the line which, it is estimated, will cost around $5,000,000. The El Paso company is controlled by the Electric Bond & Share Co., which owns a number of public utilities in that region. It is probable that if the project reaches the construction stage the line will be routed so as to tap the gas area south of the Maljamar Pool where an additional supply of gas might be obtained if the original source should prove inadequate. An official of the Texas Production Co., which has two gas wells in that territory, stated recently the company had not yet decided what disposition it will make of its product.

In Chaves County, the Arena Oil Co.'s No. 1 Wilkinson, which has been shut down for some time at 780 feet, is being rerigged and drilling will be resumed within a few days. Operations will continue in the name of the Arena Oil Co., though it will be joint with the Manhattan Oil Co. and McGinnis Brothers, who recently acquired a controlling interest. McQuigg & McQuigg's No. 1 Neis, NW NW, Section 7-5-29, in the Olive Basin district, set the 10-inch at 1,147 feet and is drilling at 1,325 feet, being still in the red beds.

In DeBaca County, the Navajo Oil Co.'s No. 1 McAdoo, SW NE, Section 16-1-27, on the Buffalo Creek anticline, which has been shut down for casing at 2,710 feet for the past four months, is being rerigged, and is putting on a new drilling line preliminary to resuming drilling. It will be necessary to run casing before much additional depth can be made.

In Guadalupe County, the Hanchett Oil Co.'s No. 1 Rutherford, Section 24-8-24, on the Alamo Gordo structure, is fishing at 4,076 feet. It passed out of red sandy shale at 4,054 feet into a yellow water sand and is still in the sand at present depth. It had 2,000 feet of water at 3,530 feet which has not yet been shutoff, and the 6⅝-inch casing will be run for that purpose.

Colfax Showing

Additional reports from the showing in Colfax County, 10 miles southeast of Raton, reported last week in a well drilled by the Ludlum Syndicate, say there was a slight show of oil at 100 feet with some water and that the hole has been carried down to 280 feet without additional showings. The test is in Section 25-29n-25e.

Another showing of interest is reported in Catron County, on the west side of the state in the SW cor., Section 3-1n-16w, on the Britton ranch near Quernado, in a well drilled for water. It topped a water sand at 250 feet, and at 350 feet had a show of 40 gravity light oil. More water was found at 450 feet. The well is in what is known as the Rite Basin in the north central part of the county.

It is possible that southeastern New Mexico will have additional railroad facilities the coming year. The Texas-New Mexico Railroad Co., a subsidiary of the Texas & Pacific, has been granted a charter in Texas to build from some point on the Texas & Pacific, near Manahans, to the Texas-New Mexico line, passing through the Winkler County oil field and through the Lea and Artesia Counties fields to a connection with the Atchison, Topeka & Santa Fe at Artesia.

Strong Butte Test

In southern San Juan County, it begins to look as if the activities of brokers dealing in leases and permits in the Stony Butte district will interfere with, if not prevent test on the Stony Butte sructure by running prices up to a prohibitive point. The Ohio Oil Co. became interested some time ago in that area and this attracted attention to its possibilities. The Midwest Refining Co. and the Continental Oil Co. have some holdings, but not enough acreage in solid blocks to justify a test. Unless speculators change their tactics, or owners of land and permits see the light, it is likely the major operators will pass it up. H. L. Hall and others made a location in Section 18-22n-13, but the rains washed out the roads and no effort has been made to move in material. The Hall location is said to be on a separate structure from the main high. Other operations in San Juan County are mostly routine. San Juan Petroleum Co.'s No. 2 San Juan, SE SW, Section 9-23-12, in the edge of Farmington, being drilled by the Markey interests, is down 150 feet and is headed for the Mesa Verde sands which have never been tested in that area. Continental Oil Co.'s No. 17, Section 2-29-19, on the Santa Fe Co.'s lease, is drilling out cement at 3,785 feet. Huntington Park Oil Co.'s No. 1 Terwilliger, Section 29-30-9, in the Blanco area, is rerunning the string of 5 3/16-inch casing which dropped last week. Hole is bottomed at 4,150 feet on top of the Mesa Verde. Union Oil & Mining Co.'s No. 2 Pine, Section 8-29-9, looks more hopeful this week, a hold having been secured on the tools which have blocked the hole for a year, but no attempt will be made to lift them out until a new line arrives. The hole is bottomed at 2,950 feet.

In McKinley County, the Producers & Refiners' No. 2, SW NW SW, Section 12-17-9, on the south end of the Hospah Dome, is plugging to, abandon at a total depth of 1,877 feet. Water was found in the Hospah sand in the Mesa Verde. This indicates that the structure is small. Wells drilled to the Dakota found nothing but water, but the Midwest has two or three producers on the top in the Mesa Verde. The Continental Oil Co.'s No. 1 Carica, Section 9-17-7, is drilling at 2,787 feet.

Colorado

The Texas Production Co.'s No. 10 Knowlton, Section 33-5n-91, on the Moffat Dome, 6 miles northeast of the Iles Dome, has at last entered what is presumed to be the Sundance sand, and found it saturated. The hole had 1,500 feet of fluid standing in it from a total depth of 4,415 feet, of which 400 feet was water and 1,100 feet was oil. The sand is very hard and tight and does not give up the oil freely. It is hoped it will loosen with additional drilling as there are indications a favorable change in the formation may make it a flowing well. The sand presumed to be the Sundance was entered at 4,000 feet and has been penetrated 15 feet. These depths do not correspond with depths reported for the past few weeks. The hole has been checked and rechecked several times and the conclusion was reached it was not as deep as at first reported. It appears on account of the magnetized condition of metal in the hole satisfactory measurements could not be made with the tape and depths now used were checked on the sand line and the drilling cable and are believed to be approximately correct. The small quantity of water appearing in the hole so far is not considered a serious problem as most all of the wells in the area producing from the Dakota had some water from the beginning, but it was not cut and could be separated from the oil easily.

The outcome of this well has been awaited with more than ordinary interest as it was expected to prove whether there were any producing horizons below the Dakota from which all production heretofore came. It found the first Morrison sand below the Dkaota at 4,226 feet which produced from 150 to 370 bbls. a day while drilling was in progress, along with 5,000,000 feet of gas. At 4,265 feet, it was given a test and made 178 bbls. of 37.3 gravity oil in 24 hours. A second Morrison sand then was cut, making 100 bbls. of oil and 3,000,000 feet of gas. Other strata in the Morrison also showed oil, followed by the Sundance as already mentioned. Proving of horizons below the Dakota on the Moffat Dome now gives Colorado two structures with commercial production in the Morrison and Sundance sands, the other being the Iles Dome, 6 to 8 miles to the southwest

Iles Dome

New production on the Iles Dome is now being shown in the pipe line runs, the daily average for the past week having been 1,343 bbls. This is not, however, the full capacity of the wells, some of which are beaned down. If opened up, they probably would make close to 5,000 bbls. The Midwest Refining Co.'s No. 4-SD Shaw, NW NE, Section 27-4-92, a joint well with the Yarg Producing & Refining Co., which made 1,010 bbls. initial beaned down to a five-eighths-inch choke, with the 8-inch bit in the hole, from a total depth of 3,276 feet, has mudded off the oil and gas to fish for the lost tool. Same company's No. 34-SD Parkinson, SW SW, Section 22-4-92, which was making 11,000,000 feet of gas from the Morrison, will have to be mudded again as the first efforts to kill the gas so drilling to the Sundance might continue failed. Same company's No. 8-SD Parkinson, NW NW, Section 23-4-92, is drilling at 1,400 feet in muddy brown shale. The Midwest has made locations for No. 33-SD Parkinson, in the SE SW SE, Section 22-4-92, and No. 3-SD Shaw, NE NW NE, Section 27-4-92. Shaffer Oil & Refining Co.'s No. 205 Yarg, NW NW, Section 26-4-92, joint with the Yarg Producing & Refining Co., is drilling at 2,060 feet. Texas Production Co.'s No. 17 Parkinson, SW NW SW, Section 23-4-92, which topped the Sundance at 3,500 feet, and is bottomed at 3,520 feet, will underream to lower the 4½-inch casing to make a formation shutoff. The well is producing around 315 bbls., most of which is coming between casings from the Morrison. Same company's No. 6 Parkinson, NW NW, Section 23-4-92, is fishing for the 10-inch bit at 2,590 feet. Same company's No. 13 Parkinson, NE SW, Section 22-4-92, is spudding at 140 feet.

In Routt County, the Texas Production Co.'s No. 1 Wilbur Rule, SW NW, Section 5-6n-86, Tow Creek Dome, which was reported last week with 800 feet of oil in the hole from the shale at 3,905-55, feet, swabbed 30 bbls. It is being deepened and is drilling in shale at 3,970 feet. The 6¼-inch is at 3,900 feet. Same company's No. 1 State, NW SE, Section 18-6-86, which has been shut down at 2,114 feet for more than a year pending settlement of litigation, is preparing to resume following a decision in favor of the Texas Production Co.

Wellington Pool

The Wellington Pool, in Larimer County, where the Union Oil Co. of California is the sole operator, is yielding some unusual and interesting results. No. 3 Buckeye, NW NW, Section 31-10-68, topped the Muddy sand at 4,473 feet in December, 1926, and encountered water. It was drilled to 4,494 feet. Recently it was decided to give it a pumping test to see what might happen. It was deepened to 4,552 feet and put on the pump. Within a few days oil commenced appearing with the water and upon the fourth day it was making better than 100 bbls. of pipe line oil. The quantity of oil continued to increase until at last reports it was making around 250 bbls. a day. The decision to give the water well a pumping test was due to results in the No. 1 Plummer, SW SE, Section 30-10-68, which pumped water for a month before the oil commenced coming in. After nine months it was one of the best wells in the field making 460 bbls. of pipe line oil a day. A few weeks ago it became necessary to pull the rods and tubing and the well went entirely to water. Again, pumping resulted in bringing back the oil and the production increased to 400 bbls. a day. The same thing happened again a few days ago and it is apparent it is necessary to keep the pump going to maintain it as a producer, but that when the water level is kept down it continues to be one of the best wells in the field.

Another surprise took place when No. 2 Buckeye, SW NE, Section 31-10-68, was opened up a few days ago to inspect its condition. It was completed as a gas well at 4,310-18 feet two years ago and shut in with a production of 6,000,000 feet. When opened up, it was found to have turned to oil and is now making from 400 to 500 bbls. a day.

On the south, or Fort Collins structure, some more freakish results have taken place. No. 1 Blunck, NW NW, Section 30-8-68, was completed more than a year ago. The sand was topped at 4,611 feet, and the well showed for about 100 bbls. in the first 11 feet of sand. It then drilled into water and the oil was flooded out. An effort was made to shut off the water with lead wool, but did not succeed and it was temporarily completed as a water well. Recently it was decided to go back into the hole and drill it down as a test to lower horizons. When the lead wool was drilled out it was found that the hole was dry, the water having disappeared. The 4¾-inch casing has been run and the well is drilling ahead towards the main Dakota sand. Union Oil Co. of California's No. 6 Buckeye, Section 31-10-68, Wellington Dome, has been delayed by a lost bit with the hole 10 feet in the sand and the hole being about half full of oil .

Boulder County

In Boulder County, the prospects for getting one of the several tests drilling on the Parallel Dome down to the Dakota are now more promising than they have been for some time. The Essok Oil Co.'s No. 1 Martin, NW SE, Section 5-1s-70, which reached a depth of 5,200 feet in a 4½-inch hole only to encounter cavy ground, went back to underream the 6¼-inch casing. It now has 4,700 feet of that size in the hole and the work is progressing slowly but satisfactorily and the hole is in good shape. It is expected that it will have to go 6,000 feet to reach the objective. The Repollo Oil Co.'s No. 1 Nichols, SE NE, Section 32-1n-70, is bottomed at 4,050 feet, and has run 4,000 feet of 8¼-inch casing. It is through the Hygiene which had a small show of oil, probably a barrel a day. No. 1 Deines, NE NW, Section 33-1n-70, which was unable to reach the Dakota, stopped at 4,730 feet and was plugged back to the Hygiene where it is making 2 to 3 bbls. a day. It probably will be abandoned.

In Las Animas County, the Parker Club's No. 1 Adams, Section 32-34-56, near Branson, ran into more water at 3,723 feet, the water coming from a sand and rising 1,000 feet in the hole. The sand was encountered after going through 3 feet of lime, above which was another water sand. The 6⅝-inch casing is being lowered to make a shutoff. So far more than 100 feet of thin water sands have been encountered, but this is not considered discouraging as in the Ramsey well, near the Colorado line in Cimarron County, Oklahoma, there were 150 to 160 feet of these sands.

While the Moody Oil Corp.'s No. 1, Section 30-41-16, on the Glade structure in Dolores County, in the western part of the state, was dry at 3,800 feet, it is stated the hole will not be abandoned at this depth, and drilling will be continued.

In Logan County, the Northeastern Colorado Oil Co.'s No. 1 State, Section 36-8n-55, Willard Dome, is shut down at 5,435 feet for additional financing. It is through 128 feet of the main Dakota sand, but upon the recommendation of several geologists, an effort is to be made to test the lower horizons.

Start Denver Gas Line

Actual construction work on the Amarillo-Denver gas line was inaugurated on December 11, when the president of the Pueblo Commercial Club took the operator's seat on an excavator at Devine, Colo., and turned the first dirt on the $22,000,000 project. Six excavators will be in use in a few days on the Colorado end, and they are expected to make about half a mile a day of trench 30 inches wide and 5 feet deep. Enormous quantities of material are being unloaded and shortly after the first of the year it is expected that 2,000 men will be employed. The Worthington Pump & Equipment Co. has been given the contract for the 6,800 horsepower pump to be installed at the compressor

station north of Amarillo. Cost of equipment is estimated at $550,000. Another compressor will be installed between the New Mexico line and Denver, probably near Pueblo.

The Mountain States Telephone & Telegraph Co. is putting in two copper circuits between Craig and the Iles Field in Moffat County at a cost of $6,000, to take care of the increased business resulting from the oil operations in that area.

Utah

The Midwest Exploration Co.'s No. 3 Ashley Creek, Section 23-5s-22e, Uintah County, is still bottomed in the Morrison at 1,655 feet, and is preparing to pull the 10-inch casing on account of a bad joint. The intentions are to land this string at the bottom of the hole before drilling into the big gas sand in the lower Morrison expected at 1,720 feet. Three thin gas sands in the upper Morrison have already been cut, all containing considerable quantities of gas, one flow being sufficiently strong to throw the bailer to the top of the derrick. Some water in the hole is causing trouble from caving. The objective is the Sundance sand expected just below the Morrison.

Utah Southern Oil Co.'s No. 1 John L. Shafer, Section 36-26-20, Cane Creek Dome, first well to be drilled to test the flank of the structure on the theory that it is a salt dome, has most of the material on location and is building derrick. It is planned to commence spudding by January 1. No. 1 Frank Shafer, the discovery well, which is being tested at 2,025 feet, has temporarily suspended pumping as tankage is full and plenty of oil on hand to furnish fuel for the flank test 1 mile to the north.

Midwest Exploration Co.'s No. 1 Early, Section 13-4-6, Duchesne anticline, is working on casing at 2,740 feet, and has not yet succeeded in cleaning out to old bottom at 2,867 feet, where operations were suspended four years ago. Texas Production Co.'s No. 1 Shipley, Section 5-27-14, Sweetwater anticline, is drilling in sandy shale at 1,985 feet. The 10-inch was set at 1,910 feet. Embar Oil Co.'s No. 1 Big Six, Section 34-25-21, Moab anticline, is drilling in at 4,880 feet in gray shale. Beaver Valley Oil Co.'s No. 1, Section 16-14-10, in the Black Rock district, is setting 4½-inch casing at 3,130 feet. Diamond Oil Co.'s No. 3, Section 29-8-3, Buskirk Dome, Utah County, has commenced spudding.

Montana

It is estimated about 40 days will see the completion of the new gas line being laid from Sunburst Field to Great Falls by the Hope Engineering Co. The recent extremely cold weather has held up the work.

A protest against the rates published by the Great Falls Gas Co. was made by labor organizations who claim the rates will be prohibitive for the poorer classes.

The Montana-Dakota Power Co., owner of the Cabin Creek gas field in eastern Montana, is planning a network of gas lines over eastern Montana and North Dakota. This firm already owns the electric franchise in some 30 towns and cities in that part of the state and furnishes gas to Glendive, Terry and Miles City. It is now proposed to lay a line 100 miles long from the Cabin Creek Field to Williston, N. Dak. Such a line would also serve Sidney and Fairview.

On account of the cold weather, only two wells were brought in in the Sunburst Field the past week. The Adams Oil Co. No. 1 found a flow of sulphur water in the Ellis sand on Section 22-34-1 and has plugged back to make a gas well of about 2,000,000 in the Sunburst sand.

The Ethridge Oil Co. on Section 12-34-2, found the Ellis sand dry and is going on down to make a deep test. It is now about 1,630 feet.

The California Petroleum Co. on Section 27-35-2 has set the 8¼-inch casing at 3,250 feet. In the deep test being drilled on Section 27-35-2 and the bit is now making hole fast in a dark lime

(Continued on Page 129)

PROTANE AND BUTANE WILL ENRICH GAS

(Continued from Page 26)

cubic foot, the gasoline entirely replacing gas oil, and it was noted that:

(A) There were no complaints of service or quality of gas supplied the consumers.

(B) The quality of the gas made and distributed was readily maintained at the approved standards.

(C) As indicated by the calorific value of the gas at points distant from the gas works the condensation in the mains and distributing system was nil. As a matter of fact this observation was partly obscured since the calorific value of the gas at these outlying points was appreciably higher than that of the gas sent out from the gas works; this difference obviously being due to a removal from the distributing system of accumulations of condensed matter including naphthalene, which would logically follow as a result of the difference in the pressures of naphthalene and the like in the two kinds of carbureted gas, namely the gases made using gas oil and using the gasoline as enrichers. Prolonged operation using G. E. gasoline may show that there is a certain amount of condensation in the distributing system, but it is evident that under normal conditions the amount of this condensate will be small and it will not comprise propane, butane and pentane.

(D) The candlepower of the finished gas (enriched with G. E. gasoline) as revealed by mere observation of the gas when burning from a flat-flame burner tip was somewhat lower than that of ordinary carbureted water gas of the same calorific value when similarly burned. A photometer was not available for making this test, but it is believed and appears to be true that this difference in luminousity of the flat-flame jet is of little if any importance in the manufacture of city gas.

Specific Gravity

(E) The specific gravity of the finished gas distributed during the operation with G. E. gasoline was rather high being 0.76 to 0.82. However, in this connection it will be noted that it has been the practice at this plant to distribute gas containing a high percentage of inerts—CO_2+N_2—taking advantage of the economies resulting from the use of the blow run, the density of this gas normally being higher than in those plants making either mixed coal gas and water gas or carbureted water gas containing a lower percentage of inerts. Calculations have been made showing that the density of finished, carbureted water-gas using G. E. gasoline as enricher need be only slightly greater than that made in the regular way using gas oil, other factors remaining the same.

(F) The composition of the lean gas (mixed blow-run gas and water gas) and of the finished gas made during these tests are shown. In this connection attention is called to the fact that the lean gas was made in a hand-operated carbureted water gas set, with a generator shell 5 feet 6 inches in diameter, using Boone Chilton coal. Approximately 9.2 per cent of G. E. gasoline (gas) was required in the finished gas carbureted to 565 B.t.u. per cubic foot. This is a smaller volume than that of the oil gas resulting from cracking the gas oil used in the ordinary carburetion of water gas, therefore a greater amount of lean gas must be made per 1,000 of finished standard gas when using G. E. gasoline than when using gas oil; this results in a direct decrease in gas making capacity unless operating changes are made to "offset" this difference. In the early part of the operation at Musatine, Iowa, no such changes were attempted and the capacity was accordingly reduced approximately 10 per cent, but subsequently the gas making capacity was raised above normal with satisfactory results.

(G) A small amount of tar—in this case, coal tar—was produced in the operation of the water gas set, the duration of the tests being too short to measure accurately the quantity which obviously must be very small. It was noted, however, that the tar formed had a high specific gravity and settled readily from water without exhibiting a tendency to form emulsions.

(H) The generator fuel per 1,000 feet of carbureted gas made increases substantially in proportion to the increased amount of blue gas in the finished product. In some of the tests the increase was a little more than this amount for reasons which were evident and could not readily ybe avoided. Operating data including the fuel used per 1,000 feet are shown.

(1) The water gas set was operated in the regular manner making water gas and blow-run gas, but enricher was not introduced into the carureter; lean gas was conducted to the relief holder and vaporized G. E. gasoline was introduced into this gas at a uniform rate as it was withdrawn from the holder. The blast gas was almost entirely burned in the usual manner in the checker chambers by the introduction of secondary air causing the temperature at the base of the superheater to rise to 1,800 degrees Fahrenheit and that at the top of the carbureter to reach approximately 1,900 degrees Fahrenheit. It was believed that at such temperatures much of the tar liberated by the coal during the gas-making period would be cracked and gasified. In fact, it seems that at 1,800 degrees to 1,900 degrees Fahrenheit some of the carbon from the tar and from any blown-over fuel should combine with steam (always present in excess in generator gas) by the water gas reaction. The extent to which this actually happened is obscured by the lack of uniformity in the lump size of the coal used.

Amount Required

(2) Calculations have been made to show the amount of G. E. gasoline required per 1,000 feet of finished gas having calorific values varying from 475 to 600 B.t.u. per cubic foot using the blown run to the extent of zero to 30 per cent. Graphs showing these relations and the density of the finished gas are shown for two grades of G. E. gasoline. (See Figure 2.)

(3) The most satisfactory method of introducing G. E. gasoline into the lean gas for carbureting purposes will depend somewhat upon plant conditions; a few simple means for accomplishing this have been shown and discussed.

(4) Calculations indicate that substantial economics can be made in the manufacture and distribution of carbureted water gas by the substitution of G. E. gasoline (cold carburetion) for gas oil at the same price as gas oil; these economies include:

(a) A decrease in the consumption of enricher per 1,000 feet of gas made resulting from the higher calorific value per cubic foot of G. E. gasoline gas than that of the gas resulting from the cracking of gas oil.

(b) A decrease in the consumption of enricher per 1,000 feet of gas made because of decreased condensation in the distributing system; the gas as made with G. E. gasoline can have a calorific value 10 to 15 B.t.u. per cubic foot less at the gas works than the ordinary carbureted gas of a given standard without altering the quality of the gas as supplied to the consumers at distant points.

(c) A decrease in the cost of purifying raw gas because of the decreased amount of naphthalene and tar and possibly of sulphur compounds present. In small plants where oxide is frequently prematurely discarded because of the presence of an excessive amount of tar, the "life" of the oxide and its capacity for removing H_2S should be increased when using the new enricher. The G. E. gasoline used in the tests was free from H_2S and contained 0.5 grains of organic sulphur compounds per 1000 cubic feet of vapor. With this quality of enricher comprising paraffin hydrocarbons it is possible not only to make a gas which is substantially free from sulphur compounds (organic and inorganic) but the gas should be equally devoid of the gum-forming and resin-resisting compounds which have been so annoying in many gas plants in recent years.

(d) An increase in the amount of available waste heat which can be utilized in heat economizers or by a modification of the operating method such as by the use of back run.

(e) A decrease in the expense resulting from the checkering of the carbureting chambers.

(f) A decrease in the cost of handling and caring for complaints of service resulting from naphthalene stoppage and the like.

Cost Discussed

(5) Some of the important items relating to the cost of manufactured gas have been discussed herein. It is recognized that normally the chief items tending to increase the cost of the finished gas are a decreased credit from the sale of tar and an increase in the generator fuel requirements. The cost of storing G. E. gasoline, and it must be stored under pressure, is an item to which an approximate value has been assigned. In some plants where the gas-making capacity is reduced a proportional increase in the direct gas-generating labor will result. In spite of these facts it is believed that the net result of the change from gas oil to G. E. gasoline as enricher at a common price will be an economy in the average gas works. In making the latter statement it is recognized that in some plants, namely, those in which high oil-gasification efficiency is obtained, in which the tar and drip oil are sold at a high price and which are well equipped for the removal of tar, naphthalene and H_2S, it may not be an economy to use G. E. gasoline at the same price as gas oil.

(6) The properties of G. E. gasoline and of the individual low-boiling hydrocarbons of the paraffin series are discussed and graphs are presented showing the vapor pressure-temperature relations. Attention has been called to the fact that consideration must be given to the properties of G. E. gasoline when unloading, pumping, storing and using it. In visualizing the nature of this product it may be likened to water stored in a tank at a temperature above its boiling point under pressure—being a gas at ordinary temperatures and pressures.

(7) In making comparisons in this paper it has been assumed that the average oil-gasification efficiency in gas works practice is equivalent to 100,000 B.t.u. per gallon of gas oil. With a good grade of gas oil a higher efficiency than this is sometimes obtained; in many of the small plants the oil-gasification efficiency is lower than this. It is believed probable that with an increasing amount of oil cracking in the production of gasoline the quality of oil available for the generation of gas will be of such a quality that it may be difficult to obtain results as good as 100,000 B.t.u. per gallon. With this in mind, in view of the general trend in the price of gas oil over a period of years it appears that the economies possible in the substitution of G. E. gasoline for gas oil at a common price will increase with time. Of the two grades of G. E. gasoline considered herein, one comprising chiefly propane and butane in equal liquid volumes, yields approximately 101,700 B.t.u. per gallon to the gas, the other comprising chiefly butane yields approximately 106,100 B.t.u. per gallon.

(8) Data are presented showing the annual march of prices of crude oil and gas oil in the Mid-Continent Field for a period of years. The amounts of natural gas and natural gas gasoline produced and recovered annually in the United States for a period of years are shown affording a means for visualizing approximately the possible and probable production of G. E. gasoline in this country from this source. Petroleum technologists state that a large production of low-boiling hydrocarbons will result from and accompany the more extensive use of cracking processes in the production of gasoline.

(9) In the experimental operation at Muscatine, Iowa, the G. E. gasoline was introduced into the lean gas in the gas-

eous state, a simple, small, tubular heat exchanger being using to vaporize the gasoline, hot water from the condenser being the source of heat. It will be noted that the latent heat of vaporization of G. E. gasoline is low and therefore a small amount of heat only is required for its vaporization.

Acknowledgments

Grateful acknowledgment is made for helpful suggestions offered by G. G. Oberfell, director of research of Phillips Petroleum Co., and O. P. Hood, chief of technologic division of the Bureau of Mines. The hearty co-operation of the officials and representatives of the United Light & Power Co. was appreciated; their engineers and chemists actively assisted in the experimental work. R. W. Thomas and F. J. Harlow of the research staff of Phillips Petroleum Co., also actively and helpfully assisted in this work. Appreciation is also expressed for the service rendered by Professor Parr, who, at his own expense, installed the Parr recording calorimeter which was used throughout the tests.—Reports of Investigations, Bureau of Mines, Department of Commerce.

CRUDE OIL IN STORAGE IN SHREVEPORT AREA

SHREVEPORT, La., Dec. 17.—Crude oil in storage in the several pools in the Shreveport district, as of December 1, totaled 28,174,056 bbls., a decrease of 391,142 bbls. from the amount in storage November 1. Steel Storage totaled 20,964,802 bbls. and that held in pits 7,209,254 bbls. Storage in each of the several pools December 1 was as follows:

	Steel	Earthen
*Caddo	3,228,177	710,732
Homer	3,003,140	.....
Haynesville	4,360,027	.....
Cotton Valley	281,696	.....
Bellevue	220,129	.....
Red River	33,858	.....
DeSoto	959,937	.....
Urania	99,885	.....
Total north Louisiana	12,187,849	710,732
*Light and heavy.		
*El Dorado	2,028,146	.....
†Smackover	6,616,976	6,396,392
Nevada County	132,831	102,130
Total Arkansas	8,777,953	6,498,522
Both states	20,965,802	7,209,254
Total storage	28,175,056	.....

*Includes Lisbon. †Light and heavy oils.

TABLE 4—Properties of Three Grades of Gas Enricher Produced by Phillips Petroleum Co.

Vapor Pressure Pounds per Square Inch Gauge—	Grade 1	Grade 2	Grade 3
At 70 degrees Fahrenheit	33	70	120
At 90 degrees Fahrenheit	50	100	165
At 100 degrees Fahrenheit	60	135	195
At 130 degrees Fahrenheit	100	185	300
Boiling point at 14.7 pounds per square inch absolute	+15°F.	—19°F.	—42°F.
Specific gravity of liquid (water=1)	.577	.55	.515
A.P.I. gravity of liquid	114	126	143°
Weight per gallon of liquid	4.8	4.58	4.24 lbs.
Specific gravity of gas (air=1)	1.95	1.77	1.55
Cubic feet of gas per gallon of liquid	32	33.8	36
Heating Value—			
B.t.u. per cubic foot	3,190	2,910	2,550
B.t.u. per pound	21,350	21,450	21,600
B.t.u. per gallon	102,400	98,300	93,000
Latent Heat of Vaporization at Boiling Point—			
B.t.u. per pound	170	177	183
B.t.u. per gallon	830	810	790
Specific heat of vapor (Cp)	.46	.465	.475
Dew point at 14.7 pounds absolute	+26°F.	+10°F.	—45°F.
Temperature at which pressure is 0 lbs. per sq. in. gauge	+15°F.	—20°F.	—45°F.

These properties are approximate only and can be readily varied to meet exact specifications or customers' requirements, by slight changes in the composition of the various grades.

Author's Note—The gasoline designated as Grade 1 above is substantially like that used in the large scale tests at Muscatine, Iowa. In the calculations upon which Figure 2 is based, the calorific value of the gasoline vapor and the yield of vapor per gallon of liquid are assumed to be somewhat higher than the figures given in the above table.

Okla. Natural Buys Gas Properties of Okla. G. & E. Co.

The Oklahoma Natural Gas Co. has purchased all of the gas properties of the Oklahoma Gas & Electric Co. in Oklahoma and will operate them as a part of its system. The Oklahoma Gas & Electric Co. will continue to operate its extensive lighting and power system, which has been the largest part of its business. It supplied gas to 16 Oklahoma towns and cities. The addition of these plants will increase the Oklahoma Natural Gas Co.'s active city franchises in the State to 50 and its direct customers to 110,000. The sale agreement calls for a change in ownership on or before March 1, 1928.

Among the cities which the Oklahoma Gas & Electric Co. operates gas franchises which will be affected by the sale are Oklahoma City, El Reno, Bethany, Britton, Yukon, Norman, Shawnee, Muskogee, Ardmore, Healdton, Oil City, Wilson and Ringling.

No announcement was made as to the purchase price.

CALIFORNIA RECEIPTS AND PETROLEUM IMPORTS

Imports of crude and refined oils at the principal United States ports for the week ended December 10 totaled 1,171,000 bbls., a daily average of 167,285 bbls., compared with 1,530,000 bbls., a daily average of 218,571 bbls. for the four weeks ended December 10 and a daily average of 205,714 bbls. for the four weeks ended December 10.

At Atlantic Coast Ports—	Dec. 10 Bbls.
Baltimore	294,000
Boston	.....
New York	396,000
Philadelphia	107,000
Others	213,000
Total	983,000
Daily average	140,428
At Gulf Coast Ports—	
Galveston district	40,000
New Orleans and Baton Rouge	125,000
Port Arthur and Sabine district	.....
Tampa	23,000
Total	188,000
Daily average	26,857
At All United States Ports—	
Total	1,171,000
Daily average	167,285
Daily average four weeks ended	205,714

Receipts of California crude and refined oils at Atlantic and Gulf Coast ports for the week ended December 10 totaled 866,000 bbls., a daily average of 123,714 bbls., against 533,000 bbls., a daily average of 76,143 bbls. for the week ended December 3 and a daily average of 64,357 bbls. for the four weeks ended December 10.

At Atlantic Coast Ports—	Dec. 10 Bbls.
Baltimore	90,000
Boston	94,000
New York	464,000
Philadelphia	153,000
Others	65,000
Total	866,000
Daily average	123,714
At Gulf Coast Ports	.....
Daily average	.....
Total Atlantic, Gulf Coast Ports	866,000
Daily average	123,714
Daily average four weeks ended	64,357

Distribution of total California receipts is as follows:

Crude	375,000
Gasoline	165,000
Gas oil	.....
Fuel oil	326,000
Total	866,000

DIED IN FLORIDA

CHATHAM, Ontario, Dec. 17.—Word has been received recently of the death at Ocala, Fla., of Harriett Westby, aged 19, widow of the late Charles B. Mullen. Mr. Mullen was one of the leading drillers in the Petrolia Field between 1877 and 1907.

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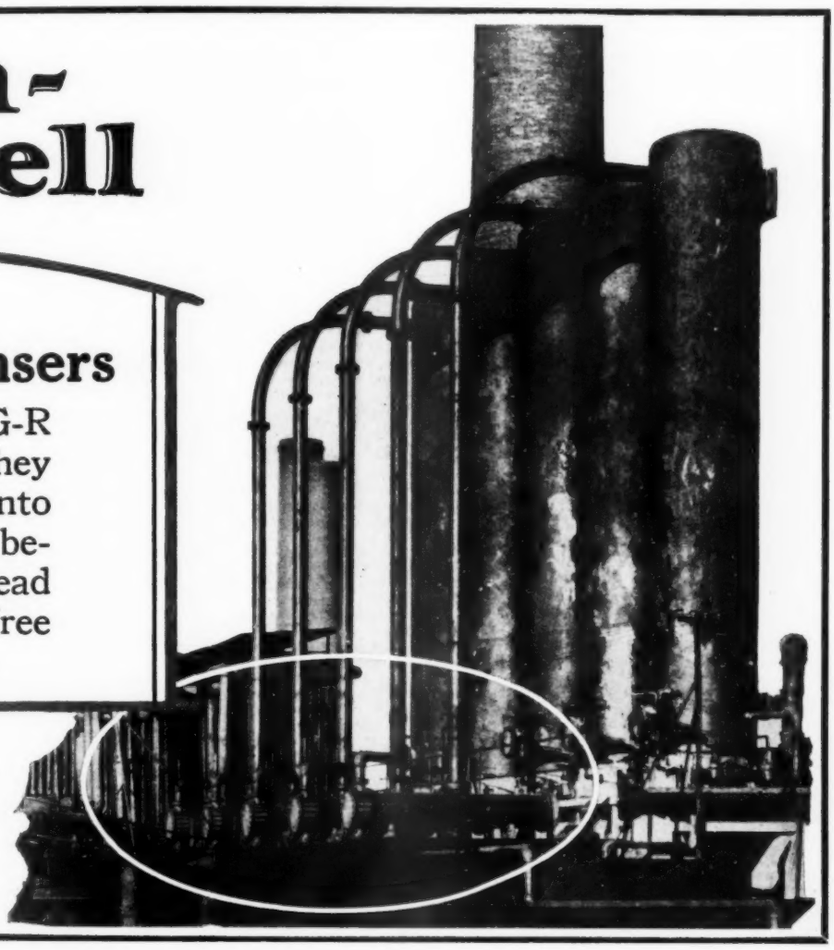

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FOR SALE OR TRADE one Oil Well Supply, 5" standard rig with 86-foot steel derrick. I. P. Williams; Box 355, Belton, Tex.

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WANTED CONNECTION, with reliable company, or individual who has acreage to develop, own drilling outfit for cheap drilling, not interested below 2,500 feet, lesser preferred. Interest taken in acreage. Cheap fuel and little water required. No fake schemes indulged in. Box C-161, The Oil and Gas Journal, Tulsa, Okla.

FOR SALE oil jobbing business in small town; doing good business, $3,500. Invoice stock, Truro Oil Co., Truro, Iowa.

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AT KANSAS CITY, MO.
The Inter State Refinery plant at 23rd and Manchester in the Blue Valley Industrial District on the Kansas City Southern Terminal is now available for immediate operation—for cracking and refining or some kindred business.
This plant has been kept in condition and used recently by an intermediate company. It consists of 20 or more tanks with a complete cracking process and other miscellaneous equipment. The machinery has cost several hundred thousand dollars in addition to the land.
The site, which was originally 8 acres, will now be a square of about 36 acres, the finest and best located refinery site in Kansas City, not far from such industries as the Ford Plant, and increasing in value.
The owner of this plant also controls the "Miehl Process," which has been in use at this plant and produces a superior gas with more mileage.
Parties interested please write or call, as we will price this at about the ground value and might arrange a bond issue for responsible organizers or operators.
A. P. NICHOLS, OWNER
921 Walnut St., Kansas City, Mo.

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Confidential investigations and reports made on Agricultural, Mineral or other Potential value of properties anywhere in Oklahoma. Rates based on service rendered.
Personal investigation by Experienced men, maps and photographs.
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CAPITAL—An experienced, dependable broker with following will aid in financing a worth while project. Address B. W. 810 Broad St., Newark, N. J.

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For gas situations having income $100.000 or more.
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MR. WILDCATTER

Do you need money to finish or go below contract depth? We may be able to assist you, write stating location and depth of well, kind of rig, amount of acreage, condition of hole, contract depth and all other information possible. Send geological map and report if you have one. Box C-33, The Oil and Gas Journal, Tulsa, Okla.

FIFTY PER CENT of production from thirty acre Winkler County lease near production for derrick, rotary tools, and casing for three wells delivered at Pyote, Texas. We will furnish lease, drilling crews, storage and all cost of drilling; or will give five eighths of production for turn-key jobs. P. O. Box 415, Atkins, Ark.

PARTNER WANTED—To develop a very promising shallow oil field in Mexico consisting of two separate tracts, one about a thousand acres, the other of about two thousand. Four holes have been drilled by owner on the smaller tract, the deepest being 514 feet; all show oil and the third hole has 390 feet of oil standing in it now. Three miles to railroad and four miles from Eagle Pass, Texas, from where development can be directed. Come on and see owner; he speaks English fluently and will give you a good deal as ever you have had in the oil game, provided you are an experienced and reliable American oil man. Very little capital required. He has permit from Mexican to develop and exploit oil for 15 and 20 years. L. Wueste, P. O. Box 183, Eagle Pass, Tex.

PRODUCTION WANTED—50 to 100 barrels settled production. Give full particulars first letter. Will pay cash.
McDANIEL OIL CORPORATION
P. O. Box 788. Cisco, Texas

OWNER OF North half Sec. 92, Blk. O. W. Pecos Co., Texas, wants propositions. E. M. Barrett, Crescent City, Fla.

NEW COMPANY in process of organization wishes to exchange stock for leases in Oklahoma and Texas. Wildcat or semi-proven. Box C-171, The Oil and Gas Journal, Tulsa, Okla.

POSITION WANTED

WANTED—By January 1, 1928—Position as Production or Tool Supt.; 15 years' experience in Production and Rotary and Cable tools; 10 years with large oil Co. Best of References by large Co. Box C-151, The Oil and Gas Journal, Tulsa, Okla.

COMPETENT MAN desires connection with Oil Co. Just returned from seven years service with British Oil Co., Production Dept. Reason for not returning to present position, on account of family. Box 150, The Oil and Gas Journal, Tulsa, Okla.

WAREHOUSEMAN, 26, married, six years experience as field warehouseman handling all supplies except refining, desires connection in west or midwest. Master of Spanish; will go to any Latin American country under suitable conditions. Address Box C-117, The Oil and Gas Journal, Tulsa, Okla.

ATTORNEY-ACCOUNTANT now employed by drilling and operating company desires connection offering greater future. Good title and contract man, can install and supervise accounting system, thoroughly experienced income tax accountant, also experienced in land department. Box C-165, The Oil and Gas Journal, Tulsa, Okla.

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A SALESMAN

Successful salesman, experience selling power plants, can secure permanent, profitable connection. Acquaintance with industrial buyers desirable. Proven products, backed by a surety bond. Sell to every industrial plant, public institution, hotel and all buildings. 100 per cent cooperation. Personal training given. Give details. Replies confidential. Position available January 1, 1928.
THE NORTH AMERICAN FIBRE PRODUCTS CO.
Cleveland. Ohio

SUPERINTENDENT WANTED for new oil refinery. Applicant must be financially able to purchase interest in company now held by present superintendent. About $5,000 required. Box C-116, The Oil and Gas Journal, Tulsa, Okla.

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3 lines	1.05	1.80	2.55	3.30
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9 lines	3.15	5.40	7.65	9.90
10 lines	3.50	6.00	8.50	11.00

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Compute white space at the above rates.

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Tulsa, Oklahoma

•

SALESMAN wanted who can handle our line in connection with the product he is now selling.
We sell to the producing end and prefer men who get to the fields. To this party we can offer an attractive proposition. Box C-162, The Oil and Gas Journal, Tulsa, Okla.

CLAUD HARLEN
Telegraph J. A. McAddon at 453 South Spring St., Los Angeles. Very important.

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DELAWARE incorporators. Charters fees small, forms. Charles G. Guyer, 901 Market St., Wilmington, Del.

CHARTERS—Delaware best, quickest, cheapest, most liberal. Free forms. Colonial Charter Co., Wilmington, Del.

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CLASSIFIED WANTS

CREATE AND BUILD BUSINESS

MAIL your advertisement now. It will be published next week. Cash with order.

LEASES—PRODUCTION

NEW MEXICO oil leases; Lea, Eddy, Chaves, Union, Quay and all other active counties; complete list and map on request. Orcutt-Harris & Co., Colcord Bldg., Oklahoma City, Okla.

SOUTHWEST TEXAS — WINKLER, Loving, Reeves, Ward, Pecos, Culbertson Counties.
Drilling blocks, Leases, Royalties.
Ranches in fee.
H. F. Anthony, Pecos, Tex.

NEW MEXICO—Leases in Lea and Roosevelt; cheap royalties in Roosevelt and Guadalupe; leases in any county; information regarding New Mexico developments. William U. Tate, Franciscan Hotel, Albuquerque, N. M.

WRITE FOR PRICES on leases, royalties, and farm lands on Sweetgrass Arch.
KEVIN-SUNBURST HOLDING CORP.
Box 313, Shelby, Mont.

UNUSUAL OPPORTUNITY; have block 10,000 acres; Eastern Kansas; 30 miles Kansas City. Geology and three correlated 2,500 ft. encircling wells show large enclosed sub-sturcture 350 to 400 ft. in height and two oil saturated horizons of more than 100 ft. in thickness each. More than 500 oil and gas wells 225 to 500 ft. in depth encircle the district. Considered a large gas proposition. Both oil and gas pipe lines across the block. Want drilling offer. Dr. E. E. Paddock, Kansas City, Mo.

"WEST TEXAS"
MEETING a persistent call coming for small tracts of Pecos County leases and royalties which heretofore I could not meet—I therefore offer the following.
LEASE—
SECTION 75, Block 2, TCRRCO-10 yr. PAID UP, standard leases, 20-40-60-80-120 or 160 acres, $3 per acre. Nothing more to pay for 10 years. YOURS and YOURS alone. Ten years is a long time, much can happen. Lease and reputable attorney's opinion mailed immediately on receipt of your remittance.
ROYALTY—
SECTION 48, Block 48, TSP 8, 2,310 ft. from WORLD OIL CO. location on Section 47. PERPETUAL ROYALTY—YOURS FOREVER—a long time. This is deeded royalty, participates in everything. 40 acres and up—1/128th and up to 1/16th (½ of ⅛th). No catch phrases. 40 A-1/128th, $30. 1/64th, $60. 1/32nd, $120. 1/16th, $240. Deed and opinion mailed promptly. I have no high sounding literature to send you. A nice, new map 10 x 14, Pecos County, your for the asking.
J. S. JONES,
Lands, Leases, Royalties, Production.
First National Bank Bldg.,
Ft. Stockton, Tex.

A REAL BET: Owner offers spread 400 acres, in ten 40 acre tracts covering development Eastern edge N. M. from Lea to Union Cos. Price $300. Rental $40 per year. There is no joker here. Leases were bought right and can be sold right. Detail, location and map furnished on request. Address, 609 First Nat'l. Bank Bldg., El Paso, Tex.

FOR SALE—100 acres in section where deep test is now drilling. This tract has two producing gas wells. $40 per acre. Also 80 acres one and one-half miles from deep test, $15 per acre. Location East of Potean.
JASPER N. BUTLER,
Potean, Okla.

FOR SALE—By owner, half section and quarter section lease near Roy Westbrook & Co., drilling well in Randall county. P. O. Box 96, Hempoliax Station, Fort Worth, Texas.

FOR SALE—Oil leases and royalties. Coal County, Oklahoma. Phone 5270.
J. H. LEAVITT,
309 North Harvey, Oklahoma City, Okla.

"IN THE TREND"
Southeastern New Mexico and West Texas counties — Lea, Eddy, Chaves, Gaines Andrews, Winkler, Loving, Ward, Culberson and Pecos Counties, oil and gas leases, royalties and drilling blocks. We buy and sell. F. S. Blackmar, P. O. Box 541, Roswell, N. Mex.

LEASES—PRODUCTION

WINKLER—PECOS COUNTIES
Leases and Royalties
W. S. PATTERSON
Pecos, Texas

FOR SALE in Fee: Sec. 6, Blk. 113, Culberson Co., Texas, $3.50 per acre, plus $1.26 due state. W. J. Bethard, 415 Mass. Ave., Indianapolis, Ind.

LEASES, royalties and drilling blocks bought or sold, West Texas. Wire or write Cope and Fox, 411 San Angelo Nat'l Bank Bldg., San Angelo, Texas.

FOR SALE—Leases, Oil Production, Asphalt, Lime Stone and Other Mineral Lands. W. P. Harley, Bowling Green, Ky.

35,000 acre block ready for drilling close to production North West New Mexico. Drilling contract or straight sale will be considered. Good proposition for oil producers and splendid opening for promoters. Write stating your intention and receive full information. Address Ernest Patrucco, Suite 720 Security Bldg., Denver, Colo.

ADVERTISING RATES

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4 lines	1.40	2.40	3.40	4.40
5 lines	1.75	3.00	4.25	5.50
6 lines	2.10	3.60	5.10	6.60
7 lines	2.45	4.20	5.95	7.70
8 lines	2.80	4.80	6.80	8.80
9 lines	3.15	5.40	7.65	9.90
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(Six words usually make a line.)
Compute white space at the above rates.

Mail your advertisement to
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Tulsa, Oklahoma

4,000 ACRES LAND in one solid block for drilling contract, four miles North of Dublin, Texas. Box 91, Dublin, Texas.

WANTED—Lease that is not paying you to operate. Will operate on a 50-50 basis. Box C-170 The Oil and Gas Journal, Tulsa, Okla.

WEST TEXAS Leases, drilling blocks and royalties bought and sold. Company and individual land requirements supplied. Cheap leases available now. Small and large buyers solicited. World Oil Co., Land Department, Fort Worth, Tex.

LAND IN FEE with all mineral rights West Texas oil fields. Two dollars and twenty five cents an acre bonus. Joe Cunningham, Big Springs, Texas.

Have ½ section proven gas leases will make a drilling proposition on same. A. F. Ohlfest, Elsmore, Kansas.

WANT CLOSE UP LEASES and royalties in all Texas, Oklahoma, Kansas and New Mexico fields. Unless you will give full information, lowest price and answer all mail promptly, don't answer this advertisement. Box C-173, The Oil and Gas Journal, Tulsa, Okla.

OIL LEASES and royalties. Ector, Crane, Pecos, Reeves, Ward, Upton and Winkler Counties; buy or sell. C. H. C. Anderson, 712 Linz Bldg., Dallas, Tex.

LEASES—PRODUCTION

KEEP YOUR EYES ON SOUTH-WEST TEXAS
Since the Pecos oil field has proven to be the largest oil pool in our country, the major oil companies are playing this Section of Texas very heavily. Can furnish 10-year fully paid oil leases in one or more sections, lots jam up against blocks recently purchased by the major oil companies, in Sutton, Edwards or Kimble Counties, from $2 to $3 per acre. R. E. Moore, 214 Dan Waggoner Bldg., Fort Worth, Texas.

WEST TEXAS Fee Lands, Leases, Royalties, Drilling Blocks and Producing Properties. Correspondence solicited from owners or other interested parties. W. T. Doyle Company, 806 Southwestern Life Building, Dallas, Texas.

FOR SALE—Bargains in small leases and royalties near and under most promising well in West Texas. Box 1020, El Paso, Texas.

ROYALTIES—PRODUCTION

RUMPH & ORR
Real Estate and Oil Royalties
Camden, Arkansas.
References: Any bank in Camden.

SHALLOW PRODUCTION WANTED—We want for client a shallow producing property—50 to 100 barrels. Send description and price. W. T. Doyle Company, Southwestern Life Building, Dallas, Texas.

WINKLER COUNTY, Texas, royalties. Tracts for the small as well as the large investor. $1 an acre up. Send for list and map. James R. Haynes, Grantville, Kans.

WEST TEXAS ROYALTIES
FOR SALE
Of prime consideration is the geological work accompanying each sale.
J. F. MARION OIL COMPANY
1213 Magnolia Bldg., Dallas, Texas.

BUYING WEST TEXAS and New Mexico royalties direct from owners in large and small tracts require outlet for some excellent bargains. McAnally & Company, Box 1127, Abilene, Texas.

GAS LOUISIANA OIL
MONROE RICHLAND
Country's greatest Gas Development now under way these fields. Royalties, Leases, Fee for sale on Producing, Proven and Edge stuff. Licensed Broker. Want connections. Eastern Cities.
CHAS. G. BENNETT,
Box 1032, Monroe, La.

PLAY THE ROXANO-LLANO TERRITORY
Several choice royalties for sale around the Roxano-Llano well in Northern Winkler County. Also other royalties. David Daniels, Box 341, Corsicana, Tex.

ROYALTIES—Our business is buying and selling royalties. We want some one to back us on division of profits. We have long experience and can give best of references. Royalties 1019 Fidelity Union Bldg., Dallas, Tex.

ROYALTY & LEASE BARGAINS—Lea County, New Mexico. Winkler & Pecos County, Texas. $1 per acre. List, Maps. Harry Haynes, Grantville, Kas.

WANT SETTLED production or part of owners now producing royalty fifty to five thousand barrels. Give past six months pipe line runs, age of wells, plat and lowest net price in first letter. Box C-172, The Oil and Gas Journal, Tulsa, Okla.

OIL INDUSTRY PRINTING

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LEASES—RANCHES—ROYALTIES
Thirty years a resident in the Center of West Texas. We know the Ranchmen, and can obtain the Best Prices.
T. L. BENSON,
306 S. Chadbourne St., San Angelo, Tex.

FORECLOSED RANCH of 648 acres near Canon City, Colo., for the amount of the mortgage, $1,600. S. Brown, Florence, Colo.

328 ACRES 10 miles North of Dallas, Tex. Well improved. Easy terms. For full description Write, W. F. Bowser, 306 So. Chadbourne St., San Angelo, Texas.

TEXAS LAND CLASS
For Poultry, Vineyards and Winter Garden tracts in one to five acres. Price $550 to $750 acre. Terms $10 down and $10 acres per month. Flowing wells, gas, electricity near San Anotnio. See Loveland Estates, Room 620, 408 Olive, St. Louis, Mo. Agents wanted.

EXTEND your business in the oil industry by advertising in the Classified Wants Section of The Oil and Gas Journal.

FLORIDA LAND CLASS
January 7 is our next cheap trip to proven section. Buy a lot or acreage where they are to drill for oil. $200 to $1,000—$10 down $10 month. See with us Hickman & Co., 408 Olive St., St. Louis, Mo.

630 ACRES clear land for sale, $50 per acre, or will exchange for good merchandise. Box 718, Norman, Okla.

OIL 64 GRAVITY

80 PER CENT GASOLINE

We have 2560 acres in San Juan Basin New Mexico with fuel and water on ground. Will give same for 2500 foot well and $2.50 per acre cash bonus. For particulars write Box C-174, The Oil and Gas Journal, Tulsa, Okla.

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FINANCE YOUR OWN project with shares bonded. Quickest, most satisfactory known method of raising capital. Information free. Bankers Interstate Security, Electric Bldg., Denver, Colo

DO YOU NEED MONEY for organizing or financing oil or mining deals? Write 136 E. 13th, Oklahoma City, Okla.

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Thru sale of securities in your corporation. Worthy enterprises only. Over twenty-five years experience. Highest references.
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25 West Forty-third, New York.

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Evidence of Conception.
Bulletin "How to Establish Your Rights" and complete information free.
LANCASTER & ALLWINE
240 Ouray Bldg., Washington, D. C.

IF YOU buy or sell royalties, leases or production you should not overlook The Oil and Gas Journal Classified Wants. They comprise the best medium of exchange available to you.

Weather Boosts Heating Oil in Chicago

But Spot Market Monday Was Not Really Active. Offers of 80 Cents Group 3 for West Texas or McCamey Crude

By J. B. Waldo

CHICAGO, Dec. 19.—Three days of near zero weather with strong winds has largely increased the consumption of all oils used for heating, and there has been a very considerable increase in the shipping instructions for gas oil and distillates, but the spot market on Monday was not really active. The bulk of the demand in the burning oil group was for the zero gas oils and there was some request for transit cars or cars in yards for prompt delivery. Many distributors have been operating with small supplies and these are in need of prompt deliveries. The demand for distillates was not as active as for gas oil. Heavy fuel oils continue to be ordered by the industries for immediate needs only. There was very little actual change in prices, although a continued demand may cause some advances in the high gravity, low cold test oils later, as these are not freely offered.

There were offers of West Texas or McCamey crude at attractive prices, 80 cents Group 3 being offered by sellers and in some instances for deliveries over three months. The same crude was offered at a little more than 60 cents at the shipping point. Sales of a considerable number of cars were reported chiefly to tank wagon distributors. This crude as offered has a low cold test flash and viscosity, 28 to 30 gravity and less than 2 per cent sulphur. The low cold test and flash make it desirable for blending.

The gasoline market was quiet, prices on the higher gravities being steady and U. S. Motors unchanged at 5¾ to 6 cents, the latter being the high point with some reports made by buyers of quotations shading the lower price, but in the absence of an active demand little attention was paid to these reports. No refiner here with material to sell is today asking a higher price than 6 cents for this grade. Antiknock gasoline is still active and there was a very fair demand on Monday, all things considered, for the higher gravities.

Demand for Higher Grade

The Chicago market last week showed the tendency of the demand towards a higher grade of gasoline. The business done was fair for the season. Distributors in the larger cities and where the roads are generally improved report that their gallonage was as good as it was two months ago. Takings on contracts were steady and the demand in the spot market for the higher gravities was sufficient to maintain prices. It was the U. S. Motor grade that suffered. Stocks may not be excessive, but there was an evident desire to sell the U. S. Motor grade and competition for orders was keen. The result was that several refiners dropped their price for this grade to the trade to 5¾ cents and as a rule this price was met by most of the sellers although several refiners were holding their price at 6 to 6⅛ cents. They admitted that they were doing very little spot business, except with regular contract customers.

There were several days last week when there were offers of U. S. Motor gasoline to marketers and in some instances to large jobbers at less than 5¾ cents. One reliable jobber stated early last week that he could buy at 5½ cents and brokers from Group 3 offered at 5⅝ cents, to which must be added their charge for buying of $5 per car. Some of this cheap gasoline has been offered by refiners outside of the group and in some instances the price applied only to Ohio and eastern Michigan points.

One lot of 1,000,000 gallons was offered here for shipment to Michigan points at a price f.o.b. refinery that figured back to 5¼ cents, Group 3. An offer to buy 100 cars was made by an Ohio jobber at 5½ cents and declined by a refinery sales office here, which replied that its lowest price was 5¾ cents, Group 3. The gasoline was purchased from some other source, presumably at the price offered. There has been no purchasing in advance for January reported and it is not likely that dealers in the country are buying in excess of immediate requirements and on the other hand refiners are not quoting for January delivery.

Contracts Come in Slowly

Contracts are stated by several refiners to be slowly coming in, but that many of the dealers are insisting on local protection It is asserted by several dealers that they have been able to secure such contracts and representatives of several refiners admitted last week that it was this question of local protection that was knocking them out of some contracts. So far as is known no refiner is writing an unlimited local protection contract although some are making contracts based on the local service station or tank wagon prices. In some of these contracts there is a cancellation clause, in others a minimum price and some have both.

A contract based on local conditions would be a risky form of gambling. This is specially true in view of the statement made by refiners familiar with details of the selling end of the business that there is no good reason to expect a decrease in competition next year and some say they look for it to be even more keen.

There is to be reckoned with today the competition among the large organizations, each of which wants a larger share of the going business; competition between local interests and competition between groups of refiners, such as Group 3 and the central district refiners.. The gasoline situation may take another turn after the first of the year, but until then only a routine business is looked for by the local trade with a larger or smaller distribution dependent largely on the weather.

Qualities Demanded

Primarily the demand from the motorist is for a motor fuel which will assure a quick start, rapid acceleration and a steady flow of power at all seasons. If it will give better mileage or prevent carbon troubles, so much the better, but these are not so essential as the qualities first mentioned. Thousands of motorists are paying a premium for a special motor fuel whose makers disclaim the statement made by some users that it prevents or removes carbon deposits. As to the antiknock qualities, many oil men regard the demand for antiknock gasolines as a passing fancy which will be forgotten as motor fuels of better general performance are provided, and used.

Competition and lower costs have resulted in the bringing out of more serviceable motor fuels by both refiner and dealer and many oil men say that the best interests of themselves and of the industry will be served by catering to the demand from the consumer for gasoline that will give better service even if it does cost a little more. Few of the present-day motorists can remember when the price of gasoline was a York shilling or less per gallon. Most of them began owning cars when gasoline was higher than it is today and not of as good quality. This is one reason for the decrease in the demand for the U. S. Motor grade, it does not possess the qualities demanded by the present-day motorist and will be displaced by a better grade, giving the desired service.

Several refiners when questioned as to the quantity of their antiknock and high-gravity gasoline sales as compared with the U. S. Motor grade, stated that roughly speaking their sales of these products were at least 50 to 60 per cent of their total sales of gasoline. Little of the 56-58 450 grade is refined which up to three seasons ago was specified in marginal contracts as deliverable from April to October 1, in place of the 58-60 437 gravity, which was specified for the other months. It is perhaps possible that with less abundant supplies of crude and an increased demand for the gasoline higher costs might cause a revival of the demand for less expensive gasolines.

Spot Demand for Kerosene Light

The spot demand for kerosene has been light, the bulk of the business done by the leading sellers being a few cars to regular customers. Prices have weakened a little, at least the 4¾-cent price for the 41-43 gravity is more often quoted, and in a general way this is the price at which dealers state that they can buy. The 42-44 gravity is now held at 4¾ to 5 cents, with fairly good sales by refiners who run this gravity. Some do not run it, asserting there is so little difference that it pays them better to make the one cut and have a rather high 41-43 gravity than the two grades.

The distillate demand has been chiefly against contracts and only moderate spot sales have been reported. Most of the distillate business is much less than the gas oil business this year. The colder weather and larger consumption of distillates has firmed the market and in some instances higher prices have been quoted. One refiner whose product consists of two grades of prime white distillate differing only in the flash point advanced the price one-quarter cent and several sellers are now asking an eighth of a cent more than recent low figures for the 38-40 gravity. There is little demand for small offerings of the 36 38 gravity but the 35-37 gravity takes its place and ships in the gas-oil freight rate.

The demand for zero gas oils, both straw and darker, has been excellent. The principal movement has been against contracts, but there has been considerable spot business. Prices have been held firmly and desirable grades are quoted at higher values. There is considerable variation in the gas oils aside from the color even with a zero pour test. The flash point is important and those with an excess of sulphur content are shunned. In one case every car delivered on a purchase totaling 100 cars was rejected on account of odor.

The matter of odor is very largely a matter of locality and season of the year. Gasoline or furnace oils that would not prove decidedly objectionable where there was plenty of fresh air may prove actually unusable under conditions prevailing in our northern winters.

Aside from the demand for zero oils for heating homes, there has been only fair activity in the demand. The gas companies are buying some oil, but most of their current requirements are met by drawing on their stored stocks or against contracts. The Illinois Light & Traction Co. (the McKinley system) bought its January requirements last week. The purchase was of U. G. I., straight run gas oil and the price was below 2½ cents. Other smaller gas companies supplied their immediate wants. There has been only a small industrial demand. Distributors have been ordering freely against contracts the larger part of these orders being for zero oils.

Fuel Oil Business Improved

The fuel oil business has been somewhat improved by the need of more fuel for heating plants and large buildings. Some of the refiners now run their list of fuel oils as high as 30-32 and even 32-36 gravity, these and the immediately lower grades being with these concerns blended oils and they prefer to call them fuel rather than gas oils and use the latter term for unblended products. There is usually a considerable difference in the flash of these blended oils and a real gas oil, but the adding of these grades has caused confusion with distributers and industrial buyers.

Last week was a quiet one in the demand for industrial fuel oil. Some of the steel companies are reported to have increased the amount of the business on their books and the larger orders placed by the Ford organization for plates and special products has given some makers of these goods a large amount of new business. As a rule the steel concerns are holding these orders for the coming year and have been slow to buy for even their immediate needs as they want the amount charged against their inventories to be as small as possible. "Push collections but do not order anything that does not have to be ordered," is the rule.

After the turn of the new year many fuel oil dealers anticipate some improvement in the demand. December, several of the sales offices state, has been fairly good in quantity sold. It has taken hard work and the profits have not been large, but they profess to be fairly satisfied with the situation.

Prices of the higher gravities and on the zero oils have held their own fairly well though they are no higher than a week ago. The low gravities are easy in tone. The difference in prices between a strictly low cold test oil and the usual refinery runs is now from 5 to 10 cents, according to the oil.

A refiner offering some oil by wire said it had a 95 cold test. Recipients of the wire are wondering if the message as received was correct but none was sufficiently interested so far as the writer knows to make an inquiry. One facetious oil man said that there was only one possible user for such an oil and added, "If you want to get an order go down to the opera house some night when the company is playing Faust and interview the character dressed in red."

Lubricating oils are moving slowly from the refineries although some inquiry for export is stated to have come to hand. The demand for cases and drums of motor oils is quiet and the industrial demand only fair. Generally the lubricating business is not active. Prices on bright stocks are low and some very cheap prices have been named here recently.

The advent of the new Ford car has brought a demand for the so-called "Ford oil." Some used to call it a nonchatter oil and the new model is understood to have had the chatter eliminated. It may be that these inquiries were merely a coincidence and not suggestive of a failing in the new car.

Some Price Adjustments

At several points in the territory where prices were below normal there have been advances to that point or to somewhat higher prices than recently have prevailed. In several of these instances the good results have been obtained through the efforts of the state association working through its officers or by special committees. The work is

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East Incredulous About Predictions

Will Await Actual Improvement Before Accepting West's Optimistic Forecasts Regarding Petroleum Price Outlook

By N. O. Fanning

New York Bureau, The Oil and Gas Journal, Room 629, No. 101 Park Avenue, New York, N. Y.

NEW YORK, Dec. 19.—No important changes in the refined oil market of the Atlantic Seaboard were recorded during the past week. The weather has remained warm and gasoline consumption has continued on an extremely satisfactory scale, but this has failed to bring much improvement in the price situation. Refiners and jobbers seem to be able to take care of all demands without any undue pinch, so far as the supply is concerned.

Oil men here have heard many optimistic predictions from the West regarding the crude petroleum price outlook, but are awaiting the actual increase in levels before accepting the same optimistic viewpoint. Competitive conditions are determining the present source of prices, and in as much as these conditions are showing no signs of improvement, price levels remain low with no immediate indication of a rise.

Perhaps it is some satisfaction to the industry when a report can be made that no price declines have occurred, in as much as decreases have come with such monotonous regularity of late. It can be reported that so far as the East is concerned no reductions were noted during the past week. Bunker fuel oil, gasoline and other products remained unchanged. All of the principal products, in fact, failed to go lower. Petrolatums maintained the gains registered recently.

The first half of December, like November, has been a period of unusually warm weather—almost a record in that respect. There has also been much rain. Nevertheless, it is considered almost certain that gasoline consumption in the East would have been materially less if this warm weather had not prevailed. This is a factor which must be taken into account in any analysis of the present status or outlook of the refined oil situation. The effect of increased gasoline consumption has not necessarily been felt as yet, but this does not mean that it will not be. It is entirely possible that in the event of a normal gain in consumption in 1928, the industry will find that it did not lay up sufficient stocks in the winter time as a result of the abnormally warm weather. In other words, the present situation may not have its real effect until the spring or summer of 1928.

Gasoline Market

Eastern refiners are still quoting 8⅛ to 8¼ cents per gallon for U. S. Navy gasoline f.o.b. refinery. The product is moving heavily at these prices, with the bulk of it at 8⅛ cents. Leading refiners report that tank car sales are increasing at a faster rate than tank wagon sales, and are at the same time deploring conditions which make it necessary to sell at present refinery prices.

Several trains of tank cars of Mid-Continent Navy gasoline have come into the New Jersey and Pennsylvania markets in recent weeks, according to reports, and has been sold to bulk station dealers at prices equivalent to about 7⅞ cents f.o.b. Atlantic Seaboard refineries. This material is now out of the way, and apparently there is no more available at this low price. At least it is reliably reported that the 8⅛-cent price now maintained represents the rock bottom level of the present market.

There is a heavy demand for 54-56 naphtha and natural gasoline in the East at present, as a result of the use by some marketers of blended gasolines. Most of this material comes from the Mid-Continent, as Atlantic Coast refiners do not care to sell anything below 58-60, largely because they can use the other fractions for further refining.

The American Automobile Association has completed a survey which seems to bear out reports of the great variation in gasoline prices along the Atlantic Seaboard, attributed in these columns to varying competitive conditions. The survey shows that the average price at points along the Atlantic Seaboard on November 22 was 22 cents a gallon. This average, of course, includes the taxes, which vary in different states. The average price in the Mississippi Valley was 19 cents, and on the Pacific Coast, 20 cents. Incidentally, this average includes high-test premium gasolines.

In the New England States the price varied 7 cents, ranging from 15 cents to 22 cents a gallon for straight run and 18 cents a gallon for high-test gasoline.

Phices in New York, New Jersey and Pennsylvania varied 11 cents a gallon on both varieties, the range in the straight run being from 12 cents a gallon to 23 cents, and for high test from 18 cents a gallon to 29 cents.

Price variations of 10 cents for straight run and 4 cents for high-test gasoline were shown for the Middle Atlantic States, the range being from 15 to 25 cents a gallon for straight run and from 24 to 28 cents for high test.

Kerosene Market

The kerosene market is the firmest of all refined markets at present, with water white holding 7½ cents a gallon, f.o.b. Atlantic Seaboard refinery. Prime white is commanding 6¾ cents but is scarce, and little is doing in this grade. Local refiners are feeling out their export requirements before hurrying any kerosene on the domestic market. Inquiries from abroad indicate a steady movement in this direction.

While the demand for furnace oil continues to disappoint, there is a feeling that the real market has only been delayed. Meanwhile, prices are holding steady, and the marketing trade is willing to wait.

Gas and Fuel Oil

Gas oil continues to move into domestic channels at 5½ cents a gallon in tank car lots, f.o.b. refinery. The purchase of gas oil for gas-making purposes on the Atlantic Seaboard has been at a record this year, and the lack of excessive competition in this branch of the oil business has helped maintain a normal price for the product. It has been considered unusual, however, that both gas oil and kerosene should maintain a firm tone in the face of acute weakness in fuel oil and gasoline. It is pointed out, however, that many refiners and marketers active in the gasoline and fuel oil markets are not interested in the intermediate products, and therefore competitive conditions are not the same. Nevertheless, the drop in "cracking" operations had been looked upon as an unfavorable factor in the gas oil market. Its effect had been overestimated, however.

The Diesel oil market also is firm, with the demand favorable and the price steady.

Bunker fuel oil is unchanged, with marketers facing the possibility of a further small cut in view of the freight situation. However, it is the opinion that the price of bunker oil is nearing rock bottom.

Lubricating Oil

Lubricating oil prices are holding steady. Jobbing demand is still somewhat below par, especially for industrial and steam cylinder oils. In the recent advance in prices of Pennsylvania crudes some factors see some encouragement, however.

Spindle oils are still weak. It was estimated recently that the New England textile mills have been operating at around 50 per cent of capacity during the past year. This low rate of operations has been reflected in the demand for spindle oils, refiners here report. It has been made up for slightly in other directions, but not to any great extent. The outlook is still considered uncertain.

Motor oils are moving in better volume. Many motorists have made a practice this winter of changing their oil entirely to one more suited for cold weather, a practice recommended by automotive engineers. Whether this is having any effect on the aggregate demand for motor lubes is not certain, but nevertheless it is a fact that if motorists would use more lubricating oil in their motors, that is, change their oil oftener, they would make up for the added cost of oil by smaller repair bills. This is a talking point used by marketers of lubricating oil which is having good results.

Paraffin Wax

The paraffin wax market is unchanged. Crude scale wax is moving in satisfactory volume. The demand for refined wax, however, is still much below expectations, especially 130-132 a.m.p. and 135-137 a.m.p.

Petrolatum

Petrolatums are firm. Buying at present is concentrated more on snow white and lily white grades, although the price situation is unchanged. Dark green is also moving on a good scale at 1⅞ and 2 cents a pound for carload lots.

The Export Market

The oil export situation here is considered satisfactory in many respects. The bulk demand for gasoline from Europe is especially encouraging. Lubricating oil has been moving in good volume both in bulk and barrels. Paraffin wax exports have been increasing after a lull of several weeks.

The foreign oil situation generally, so far as marketing is concerned, seems to be settling down to a more normal basis. The Russian situation seems to be adjusting itself and in a competitive sense conditions are far from discouraging. Oil exporters here, while not overoptimistic, believe that the foreign markets will pusue a fairly normal course next year, with consumption showing a substantial increase.

There has been quite a heavy rush of paraffin wax into export channels, attributed partly to year-end deliveries on previous contracts. New business is not so plentiful. During the week ended December 14 more than 1,394,000 pounds of crude scale wax were shipped and during the preceding week over 3,000,000 pounds of refined wax.

There has been a slight falling off in the demand for cased gasoline and kerosene from South American countries. At the same time the exportation of cased kerosene to the Orient has maintained a steady pace, while an unusually good demand for lubricating oil in barrels for export to Chile is reported. This business has always been small, but indications are that it is taking on very good proportions and will continue to do so.

There are several features of interest to record in connection with the recent British petroleum trade. There was little change in the total imports compared with earlier this year but a rather wider variety of sources is evident for several products, together with an unusually large importation of kerosene. It is also noted that imports of Russian oil have been steadily declining.

New York Exports

The following table shows principal exports of petroleum and petroleum products from New York during the last three week; (all figures in gallons unless otherwise noted:)

	Dec. 14	Dec. 7	Nov. 30
Gasoline:			
Bulk	12,825,939	4,940,494	.....
Cases	242,690	282,100	634,600
Kerosene:			
Bulk	2,965,771	3,945,270	.....
Cases	1,312,000	1,045,940	2,325,940
Lubricating oil:			
Bulk	447,972	4,981,445	.....
Barrels	394,900	1,203,950	324,600
Cases	57,230	11,510	50,610
Lubricating grease:			
Bbls. (lbs.)	.....	281,250	337,950
Paraffin wax:			
Bags (lbs.)	607,860	3,014,220	132,000
Bbls. (lbs.)	1,394,600	542,630	326,325
Petroleum asphalt:			
Bbls. (tons)	.....	.....	.....

The foregoing figures include all shipments of 500 bbls., 1,000 cases, or over.

Tanker Market and Movement

The oil tanker charter market is active, with rates in some trades reaching new low marks. One of the lowest rates ever taken for the California-Atlantic Coast trade was reported, of 58 cents, for a vessel to carry gas oil, January loading. This compares with a peak rate not many months ago of about $1.15.

There is a noticeable absence of activity in the chartering of vessels for the export trade. At this time last year there was a scramble for bottoms, in many instances tankers being taken on a time charter basis for from 6 to 18 months. Now there is little being done for 1928 loading.

New fixtures include the following:

Tanker Vaba, Venezuela to north of Hatteras, light crude, consecutive trips during 1928, 26 cents.

Tanker W. L. Steed, California to north of Hatteras, gas oil, January loading, at 58 cents.

Tanker Elsa, Gulf to United Kingdom-Continent, 7 to 9 months' consecutive trips, 19s, option from north of Hatteras, 16s 7d.

Tanker Huguenot, Gulf to north of Hatteras, gasoline, December loading, 18 cents.

Tanker Lunula, Gulf to United Kingdom-Continent, 16s, option Curacao, 14s 6d, or Abadan, 27s, December loading.

Tanker Vimeira, north of Hatteras to Kingdom-Continent, gasoline and (or) kerosene, January loading, 13s, option Gulf loading, 16s.

Tanker Antietam, San Pedro to north of Hatteras, crude, 65 cents reported, prompt loading.

Tanker W. W. Mills, Gulf to Boston, light crude oil, December loading, 20½ cents.

Tanker Laristan, north of Hatteras to United Kingdom-Continent, January-February loading, 13s 6d, from Curacao, 14s 6d, from California, 25s 6d.

Tankers Relieve Situation

Transportation difficulties in Venezuela, for oil exportation, are somewhat relieved by recent tanker additions, one American company having received three tankers since April, with six more under construction. Another company has six tankers under way which will be ready for delivery within the next six months. A Dutch-English company has seven tankers building or on the way to Lake Maracaibo, and an English company is building three tankers. It is probable that by next April these 25 tankers, each carrying from 15,000 to 17,000 bbls. of oil, will be in service, permitting the additional exportation of 125,000 bbls. a day.

The additions to the tanker fleets per-

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Credit in Sale of Refined Products

Unwise Policies Injurious to Both Borrower and Lender. Many Phases to Consider in Adopting Any Plan

By John D. Gill
Atlantic Refining Co.

BORROWER AND LENDER IN OIL TRADE

If a buyer does not pay for merchandise at the time he receives it he becomes a borrower of the equivalent of money. The seller becomes a money lender. Presumably the interest on the loan for the agreed period of time is included in the price the buyer pays. Probably this presumption is fair for all transactions in which discounts are given for cash. If discounts for cash are not given it may be assumed that the interest on the loan is paid to the seller indirectly through lessened selling expenses made possible by the assurance of the buyer's continued patronage.

Such a transaction defines credit in the sense in which it is used in this article—the delivery of a quantity of a petroleum product in the belief that payment therefor will be made duly. For the present discussion there were selected two aspects only of the subject, derived from the commonest questions confronting a seller—"How to weigh the wisdom of extending credit for an initial amount and time" and "What course to pursue if the borrower defaults." On the one hand the seller contemplates the possible profits of the sale, and on the other the loss of interest on his money, and perhaps also, of his principal. Should the buyer ponder over the wisdom of borrowing as much as the seller does of lending?

In the times of keen competition for orders, when the normal functions of credit extensions are often prostituted for the acceleration of sales, the seller who must decide quickly to grant or decline credit agrees that it is easier to take chances than obtain facts. Underlying and overtopping his reasoning is the paramount fact of the credit his competitors will extend. His terms must be as liberal as theirs, unless—and too often this difference is overlooked—the competitor is able to set aside a greater reserve for bad debts out of the larger profits of more efficient operation.

Businesses in which the buyer makes purchases exclusively from one seller, few in number over long periods of time, and carries considerable stocks for the convenience of the seller, may expect longer credits than the buyer whose inventories are kept small, whose purchases are numerous and frequent, and whose turnover is rapid. As a matter of policy the seller may expect to provide only part of the petroleum merchandise capital of his customer, in which case the buyer must provide the difference between the time granted him and the average time taken by his customers; or he may provide all the capital for the petroleum merchandise of his customer, in which case he may expect payment when the goods are sold by his customer and paid for; or the seller may expect to assist in financing the buyer to a still greater extent through long credits.

A dealer in gasoline doing a cash business has ample credit if he pays for each delivery at the time of receiving the next succeeding one. To force longer credit on such a dealer is unnecessary, unwise; and to afford indefinite credit to a dealer doing a credit business is to make the dealer indifferent to the collection of his own accounts. There is a difference between selling automobiles on long deferred payments, with interest charged, and always with a substantial collateral, and selling gasoline without special interest provision and without hope of repossession.

Unwise Credit Hurts All

It is not conceded that a seller may extend credit to whom, for how much and how long he pleases on the ground that any loss is his loss. His unwise lending may cause his customer to unwisely expand his business, ruining himself ultimately and causing unwarranted and unprofitable extension of facilities by his competitors. On the other hand, the profit makers of the industry should have almost unlimited credit to enable them to wisely and rapidly expand their business and so increase their usefulness to the community. Such credit extension to the efficient, of course, entails the minimum of risk to the seller.

The seller's assurance of pay duly is based upon facts relating to and supplied, directly or indirectly, by his customer. How the customer has paid other vendors in the same and different lines is of considerable significance. But the reputation for "prompt pay" is not enough. Managements change, and with them the sense of obligation. Fortunately they change at times for good as well as for ill. But, outstandingly, the conditions of trade which made it possible for the prompt meeting of obligations may become adverse. High character, undeniably, is a solid side of the triangle of assurance of pay, but who will teach us to analyze character and who will take the time to put the analytical methods to use? We don't analyze character; we guess at it and often guess incorrectly. Character is basic, but we can tell about a buyer only on the grounds of his present acts. What he is doing, and the direction in which he is going, count.

The customer's investment in his business is a safe to which the seller may entrust his lendings only when he knows that it is not already overcrowded with the obligations of other creditors. Moreover, the seller's repose in the customer's capital in plant and equipment gives rise to a harmful point of view—the seller extends credit, being fearless of loss to himself in the event of the buyer's default through failure, whereas prompt payment and continued patronage depend upon the buyer's success.

The success born of the buyer's wise management is the greatest assurance of payment which the seller may have. To know that the goods he sells the borrower will produce for the borrower enough income with which to pay for them, for the expense of their handling and something of profit besides, and that the revenue thus derived will be justly applied is to have an adequate guarantee. Such assurance minimizes the risk of credit extension even though the borrower be unrated in the commercial credit agencies and has little invested in tangible effects. Later, this phase of the question will be discussed more fully.

Credit for Speculation

The relation between the buyer's requirements and his request of credit is of great importance. The dealer who sells 10 cars of gasoline per month and asks credit for 20 cars within a month is asking for a loan with which to speculate. True, he may outguess the market and by the making of greater profits become a substantially better risk than if he bought only his sales requirements. On the other hand the market may react unfavorably, causing the buyer serious loss on the entire transaction. It is not presumed to say that such a would-be speculator should be refused; only that the seller should have more than ordinary assurance that whichever way the market moves his loan to the buyer will be secured.

Significance of Discounts

As the industry is now constituted there is some reasonable expectation that borrowings shall equal lendings, that accounts payable shall equal accounts receivable. In particular instances, of course, this natural relationship is actually out of balance; in other cases, it is apparently out of balance due to the taking of discounts on accounts payable. The custom of granting discounts for cash is perhaps the surest indication of the business man's attitude toward the extension of credit. The discount for cash is always at least twice, and sometimes from four to ten times the normal interest value of the money involved.

The difference between the normal interest rate and the discount rate is some measure of the charge which is made for the risk taken. Higher rates of discount are in the nature of a penalty paid by the buyer who has insufficient working capital, whose profits of necessity must be less than those of his competitor who discounts his bill. Strangely enough, some buyers would rather be obligated to a vendor than to their bank, though by shifting their obligation to the bank at least half the interest charge on their purchases might be saved. The willingness to assume an obligation from the bank pays well. One value of the possession of fixed assets, in the absence of ample working capital, is the ability to borrow on the fixed assets to meet current obligations. The borrower who sees these relationships clearly would not become delinquent in the belief that he was getting the use of the seller's money without an interest charge.

Long Credits

That the extension of unusually long credits should be made the basis of business getting and holding is, in the main, perhaps, a just cause for regret. Long credit is a form of price cutting resulting in a reduction of profits to the vendor and engendering a policy of looseness in the buyer. Long credits mean short working capital, which is allegedly responsible for about a third of all business failures. Certainly there are instances in which young, weak businesses have been nursed to strength and maturity by long credits, but such cases are the exception and reflect a condition of co-operation between the buyer and the seller which we shall discuss presently.

Long credits should depend for their justification upon the increased efficiency of the buyer affected thereby; to make long credit a tool for the getting of business is a questionable policy. Certainly, salesmen in the long run are weakened by such practice, just as they are by any other bargain price policy.

Case of Delinquent

What to do in the event that the buyer does not meet his obligations with reasonable promptness is often more perplexing than the problem of the initial extension of credit to him. Had all pertinent facts been obtained in the beginning and kept up to date the most suitable course would probably not be hard to see. But, while much credit is extended without substantial grounds therefor, the further extension of credit to a defaulter without ample basis for hope of recovery is to assume an unwarranted risk. The most aggressive credit risk investigator may hesitate to ask certain questions of the prospective customer, but the most timid creditor has the right to know enough about his debtor's business to be guided accurately in the further extension of credit to him.

Under stress of the buyer's delinquency the relations between the buyer and the seller should become closer than heretofore through a community of interests previously nonexistent. Contrarily, the gap between them often widens because the seller's salesman, who is the only field representative of the seller available, feels that there is little to be gained by him through additional intercourse with the delinquent buyer. The credit department of the seller may be far removed—sees only the fact of delinquency—looks through the eyes of a banker at the delinquent.

For the buyer, too, it is a crucial time. He needs merchandise to continue his business, to hold his customers. For cash he may obtain merchandise — from his creditor or others. But if he had cash he could pay his bills and clear his record. He needs more credit.

Further extension of credit may make it possible for the delinquent to retrieve his standing and save his business, or it may cause the weak debtor to go further in the wrong direction and carry the seller's money with him. A heavy responsibility rests on him who must decide upon the course to follow. The customer's failure, even with recovery for the seller, means for the latter loss of patronage and for the community economic waste. Waste is the accompaniment of failure.

Misapplication of Funds

Why can't the buyer pay? Did he sell the goods? Did he collect for them? What did he do with the seller's money? The answers to these several questions should do much to dictate the course the creditor must pursue. Obviously, if the delinquent's goods remain unsold, or have been sold but not paid for, there is some evidence of good faith and perhaps of bad management. And even if the goods have been sold and paid for and the money spent for expansion of the business, there is still hope of recovery for the creditor and business stabilization for the debtor, if the facts are reviewed and both parties agree upon a safe course of procedure for the future.

The right to use one vendor's money with which to pay for another vendor's product has been assumed by some dealers in gasoline. Thoughtlessly, perhaps, but only the fact can be weighed. The expansion of physical facilities out of receipts for unpaid for gasoline has been attempted to the great hurt, ultimately, of buyer and seller. The creditor's reward for long deferred payment of his money may be small indeed, if the debtor's expansive manipulations prove unprofitable; or his reward may be the satisfaction that comes from helping a weak customer grow strong, and the profits of a long period of business relations thereafter.

The use to which the buyer puts the seller's money is evidence of the buyer's

judgment, business ability and attitude toward his obligations. He may have used this money to meet some urgent obligation, as an old bill for merchandise, or he may have invested the money in real estate, or other plant and equipment for the expansion of his business, or he may have spent the money in a moment of thoughtlessness on something altogether irrelevant to his business.

Of two things the seller must be sure before extending wisely additional credit, first, that the merchandise which he ships to his delinquent customer will be sold at a profit to his customer, and, second, that the receipts from such sales will be used to pay for all of the last shipment and provide for some payment on account of earlier shipments for which the buyer has been delinquent.

The process of determining that the goods will be sold at a profit is simple in theory but not always easy of execution. The selling price must be greater than the cost price to provide for all of the expenses and something besides. The delinquent may keep detailed records of his receipts and expenses currently and in such condition that they can be readily understood by the seller's representative, or his records may be exceedingly meager and require construction and amplification.

Taxes, rentals, notes payable, insurance and similar irregular items must be taken into the reckoning, and complicate the seller's task to determine profits, because they do not readily come to the surface. Inventories must be brought into the reckoning, for without inventories in the picture, receipts from sales might be made for the hazards of the business which are not covered by insurance, such as fire and personal damages resulting from motor vehicle accidents.

Certain unusual hazards of the business were mentioned as having a decided bearing upon the profits of the delinquent. These hazards were of the "act of God" variety and in the main entirely beyond the control of the delinquent. To them should be added the ever present and weighty hazard of the gasoline business—the hazard of the loss of profits from conflict with the cut price policies of competitors. This risk is difficult to estimate but it is ever threatening and has brought ruin to many dealers. Furthermore, there is the hazard which comes from a general lowering of price levels, so that it may be quite impossible for a dealer to receive for his inventories as much as he paid for them. Perhaps this is a sufficiently substantial argument to persuade most dealers against the building up of stocks greatly in excess of their current requirements, for most dealers are unlucky gamblers and the chance of losing is always as great or greater over a period of time than the chance of winning. Perhaps the first act of a creditor in assisting his delinquent customer to stabilize the latter's business should be the reduction of his customer's stocks to a minimum consistent with a continuous supply for the trade.

It is clear from the foregoing sketch of facts which the creditor requires that close co-operation between him and the delinquent will be necessary if the delinquent is to recover and the interests of the creditor are to be safeguarded. The delinquent may look upon the constructive efforts of the creditor as interference, or he may see therein great assistance to him in the stabilization of his business; but in all cases such intimacy of another with the affairs of his business must be looked upon as the price which a delinquent pays for his delinquency. Every debtor should realize that he is playing into the hands of his creditor. Maybe into strong, kind hands to help him and lead him to success, or into strong, hard, grasping hands desirous of getting a stranglehold upon his business. Whether the outcome makes for the delinquent's success of failure, however, will in all probability depend upon a degree of expertness with which the delinquent follows the suggestions of the seller, assuming that the seller, regardless of his desires for control of the debtor's business, is faithful and wise in his proposals.

Insuring Return of Loans

If it has been determined to extend credit beyond the original terms in the assurance that profits would be made by the customer on the sale of the products, it yet remains to effect some plan by which a large proportion of the receipts will be diverted to the creditor. Improvements in this particular is greatly desired. If it were possible, and sometimes it is, for a representative of the seller to sit over the treasury of the buyer, day to day remittances to the seller would be possible and practical; but more often than not it is impossible for such representation of the seller in the buyer's business and the seller must depend upon the buyer for such remittances. Losses, of course, are minimized by shipping to the buyer minimum quantities of merchandise required by the business and insisting upon payment at the time the next delivery is made, it being expected that the buyer will have collected cash and his accounts receivable on the preceding shipment. It may be reasonable at this stage of relations for the seller to obtain the buyer's mortgage notes on specific pieces of equipment and property, as an earnest of the buyer's willingness to abide by the plan.

It is our observation that the work of the credit and collection department has to do too often with the mere dunning of the delinquent. It is acknowledged that a man who owes a bill shou'd pay it when due, and on the surface it should seem sufficient for a creditor's collector to simply ask for the money. Further, it is recognized that, usually, the most importunate creditors are served first; hence there is some practical warrant for the practice of dunning. But how often should the collection department ask for payment in practically the same manner, except that each succeeding request is couched in more forceful, less courteous language?

We suppose that every co'lection department has a series of form let'ers which it sends to its delinquent customers requesting remittance. The first request for payment went forward, possibly, without knowledge that the customer had sold the goods and been paid for them; or that the goods were unsold; or that the goods had been sold and paid for and the receipts therefrom had been misapplied. There is perhaps no more knowledge of this important matter when the sixth or eighth or tenth letter goes forward.

Numerous duns have an effect upon debtors who are weak in the management of their funds and who will pay the creditor who calls most loudly and most frequently for pay; but duns do not he'p the debtor who has been temporarily embarrassed by conditions beyond his control or whose financial embarrassment is due to a mistake of judgment which has weakened his financial position. The point at present is that collection effort too often is not constructive effort. It is comparable to the efforts of some salesmen. A salesman asks for orders that are going to a competitor without advancing reasons why they should come to him instead of to the competitor; collectors ask for money without knowing whether there is money or whether there will be money to enable the delinquent to pay.

If the fear of the loss of a customer's business to a competitor through the exercise of a proper credit policy was not so great, there would be little cause to fear the loss of the money represented by an outstanding account, and the only proper guide to action is knowledge of our debtor customer's affairs. Only such knowledge will save us, on the one hand patronage, on the other direct monetary loss.

The basis for further extension of credit to the delinquent must depend on at least two basic conditions, namely, the attitude of the debtor and the profit-making power of the debtor's operations. The debtor's attitude becomes a serious factor in those instances in which he has misapplied the income from the sale of the goods shipped to him; but the debtor's attitude has little effect on the wisdom of further extension of credit to him if he is conducting a profitless business.

It is easy enough to send good money after bad. It is not easy to determine with certainty that additional credit will safeguard an outstanding account. Purchase obligations should be paid out of receipts. What assurance does the seller have that additional shipments to the debtor can be paid, will be paid.

EAST INCREDULOUS ABOUT PREDICTIONS

(Continued from Page 127)

mitted expansion of production to 13,946,139 bbls. in the third quarter of 1927, compared with 8,438,727 bbls. during the corresponding period last year. The exportation of 4,069,044 bbls in September was the heaviest in the history of oil development in the Maracaibo district, but it is considered probable that the monthly exportation now will remain above 5,000,000 bbls. Unofficial figures place the October exports at more than 6,000,000 bbls.

The expansion in exports from Venezuela is indicated by large receipts from that country during the past week, swelling the receipts for the week from South America to 1,153,000 bbls., or a daily average of 165,000 bbls. Imports from Mexico, in contrast to this, totaled only 186,000 bbls., a daily average of 27,000 bbls. a day.

The Gulf Coast contributed 2,418,000 bbls., or 345,000 bbls. daily, to the receipts for the week ended December 14. Receipts from the Pacific Coast totaled 176,000 bbls., a daily average of 25,000.

The total receipts from all sources for the week were 3,933,000 bbls., a daily average of 562,000. This compares with a total of 4,219,000, or daily average of 603,000 bbls. daily, the preceding week.

Daily Average Receipts

The following table shows estimated daily average receipts of crude and refined oil by water at Atlantic Coast ports for the past three weeks; also monthly record for the past 12 months (figures in barrels):

	Week Ended		
	Dec. 14	Dec. 7	Nov. 30
Gulf Coast	345,000	362,000	320,000
Pacific Coast	25,000	121,000	78,000
South America	165,000	75,000	120,000
Mexico	27,000	45,000	6,000
Total	562,000	603,000	524,000

Daily Averages by Months

	Gulf	Pacific	S. Am.	Mex.	Total
Nov.	318,000	62,000	109,000	42,000	531,000
Oct.	314,000	98,000	91,000	38,000	541,000
Sept.	336,000	97,000	99,000	69,000	601,000
Aug.	397,000	90,000	78,000	80,000	645,000
July	406,000	83,000	49,000	78,000	616,000
June	378,000	118,000	47,000	68,000	611,000
May	332,000	58,000	53,000	91,000	534,000
April	388,000	93,000	61,000	69,000	611,000
March	345,000	103,000	81,000	36,000	565,000
Feb.	379,000	89,000	48,000	40,000	556,000
Jan.	362,000	73,000	61,000	49,000	545,000
1926:					
Dec.	363,000	57,000	61,000	49,000	530,000

The foregoing figures are based on the carrying capacity of incoming oil-laden tankers.

WEATHER BOOSTS OIL IN CHICAGO

(Continued from Page 126)

Indiana and Illinois it is known that there are excellent prospects that the normal status will be soon restored. An advance at some central point includes much more than the one city listed. At Decatur where the prices were advanced 3 cents per gallon on the afternoon of December 13, there were not only the stations within the city but in a dozen or more places surrounding the city where prices went up at the same time.

There is a good deal of something like distrust among the various companies. In one case the manager of a company having several stations in a territory that has been recently brought up to higher prices told his local station managers to watch the other stations and when they changed their price cards to do the same. In some cases the station managers have been against the advance, feeling that the new prices would be secretly cut in some way again, but the trade as a whole is anxious for a clean slate and the movement for better conditions is increasing in the vicinity of this city at least.

There are some of the country and smaller city dealers who feel that they should pass along some of the benefit of the lower gasoline costs to their trade in a direct reduction of prices rather than by quantity discounts which they assert go to a few users of gasoline who the dealers say do not need and do not appreciate the discount as much as would the average motorist.

There is also the credit feature. Dealers say that the motorist who drives into the station and buys, pays the highest price and pays it in cash. No sales expense is incurred, no expense for bookkeeping, no loss by bad accounts. The average sale is no smaller to these chance motorists than to the salesman of a large concern who, simply because he is one of a score or more working the territory for the same concern, obtains for his employer a discount that is not earned except by the mere fact of a total quantity bought. Keeping track of this business more than offsets the possible gain made through such accounts. The argument is constant and seemingly without result, yet some day it may bring about a better, because more equitable, system of pricing gasoline to the public.

Another argument is that if the price of wheat is low the miller must and does make a lower price to the distributor and the grocer passes along the decline to the user of the flour. There is much less wrangling about the price of flour than about the price of gasoline, though everybody uses flour daily.

ROCKY MOUNTAIN AREA

(Continued from Page 122)

formation about 3,500 feet. This well is thought to be in the Devonian formation and some showings have been found in this hor'zon.

ROCKY MOUNTAIN PRODUCTION

Runs From the Field	
Wyoming	
Salt Creek	42,110
Teapot	....
Big Muddy	2,760
Grass Creek	2,450
Elk Basin	820
Greybull	20
Dutton Creek	....
Notches	....
Rock River	2,760
Rex Lake	....
Lance Creek	1,060
LaBarge	620
Mule Creek	610
Poison Spider	180
Hamilton	610
Osage	320
Lander	810
Pilot Butte	....
Ferris	50
Byron	60
Lost Soldier	2,660
Simpson Ridge	40
Total Wyoming	57,940
Montana	
Cat Creek	1,890
Lake Basin	150
Kevin-Sunburst	11,000
Total Montana	13,040
Colorado	
Florence	696
Moffat	1,141
Fort Collins	3,049
Walden	....
Iles Dome	1,350
Rangely	100
Tow Creek	467
Boulder	25
Total Colorado	6,828
New Mexico	
Rattlesnake	....
Hogback	580
Cap Rock	103
Table Mesa	....
Artesia	1,394
Total New Mexico	2,072
Total Rocky Mountain	79,885

A. I. M. E. PRESIDENCY

George Otis Smith, director of the United States geological survey, will probably be the next president of the American Institute of Mining and Metallurgical Engineers. The nominating committee, headed by R. V. Norris, has named Mr. Smith as director and president; W. H. Bassett, director and vice president; George D. Barron, director and second vice president. Other directors are H. C. Bellinger, Robert E. Tally, Karl Eilers, J. V. W. Reynders and H. G. Multon.

REFINING AND MARKETING

NEW JERSEY STANDARD TO MARKET IN PENNSYLVANIA

The Standard Oil Co. of New Jersey has definitely entered the Pennsylvania marketing territory through its subsidiary, the Pennsylvania Lubricating Co. River terminals for the distribution of the company's products will be established and the first one will be placed at Pittsburgh. Sites for retail stations are being secured also. Previously, the Pennsylvania Lubricating Co. restricted its sales to that of supplying special greases to the steel mills.

Barges will ultimately reach other points from the company's plant at Parkersburg, W. Va.

Pennsylvania was not originally part of the marketing area of Standard Oil of New Jersey in the old grouping. That State and Delaware were the recognized territory of the Atlantic Refining Co. The latter in recent years has gone into marketing in New Eng'and states, part of Standard Oil of New York territory and last year purchased distributing companies with stations in Virginia, Maryland and North Carolina, long regarded as territory of Standard Oil of New Jersey.

REFINER PRESIDENT OF MONTANA CHAPTER

M. C. Henderson, vice president of the Sunburst Refining Co., was elected president of the Montana division of the Rocky Mountain Oil & Gas Association at the annual meeting of the association held last week at Great Falls. Mr. Henderson has previously served the association as vice president.

M. C. Henderson

Mr. Henderson is widely known in Montana oil circles having been active in the refining and marketing branches for several years. He is manager of the Great Falls refinery of the Sunburst Refining Co. and also has charge of the company's marketing.

MISSOURI JOBBERS MEET

B. F. Justrite Oil Co., Poplar Bluff, Mo., was elected president of the Southeastern Missouri Oil Marketers Association at a meeting held last week at Festus, Mo. Other officers elected were J. Davis, Davis Oil Co., Bloomfield, Mo., vice president, and E. C. Smith, Kelso Oil Co., Cape Girardeau, secretary and treasurer.

NEBRASKA INDEPENDENT OIL MEN HOLD CONVENTION AT OMAHA

OMAHA, Neb., Dec. 17.—Three hundred and fifty members of the Nebraska Independent Oil Men's Association, together with a sprinkling of independent oil men of western Iowa and southern South Dakota, held a two-day annual convention in Omaha this week and at the close of the meeting voted it the most successful and pleasant session ever held. Many points of interest to the Nebraska association were discussed, including sale of coupon books, gasoline road tax, "bootleg" gasoline, etc.

Municipal gasoline filling stations cast their shadow over the convention and members seemed to feel that the oil business in Nebraska is in a rather precarious condition. This shadow of municipal ownership was brought about by a decision by the United States Supreme Court, handed down two weeks ago, to the effect that the municipal station at Lincoln, started by Charles Bryan when he was governor, is altogether within the Nebraska law and can be operated just as long as the city of Lincoln chooses to remain in the gasoline business. This decision gave any other Nebraska Municipality the right to open and operate publicly owned filling stations and the fear that in the spring many towns will take advantage of this permission to go into the oil business, caused uneasiness to many of the members of the association.

With this danger, as well as further legislation along the same line, in view, Secretary-Treasurer Charles M. Sutherland, in his report of the past year and prospects for the future, warned association members to be very careful of the legislative candidates they support at the next election. Morris Milder, president of United States Oil Co., of Omaha, retiring president of the association, said the oil business is today in the same condition as agriculture and for the same reason—overproduction.

"Too generous production of crude oil is seriously depressing prices," President Milder told the convention. "Better understanding among ourselves will put the oil industry on a stronger footing," he declared. "We of the agricultural states know the position of the farmer and because we are in the oil business, we can sympathize with him. However, no matter how difficult the road of the farmer and the oil man may be to travel, both industries are fundamentally sound for they are based on great natural resources, of which no one can deprive us, and both are based upon a demand for commodities which are absolute necessities. All we want is a fair profit—a fair return on our investment—and to accom-

(Continued on Page 137)

ACME CO. OFFERS BLEND

CHICAGO, Dec. 17.—The Acme Petroleum Corp. has placed on the market a new motor fuel which it designates as Acme 4400. This is a benzol blend with an endpoint of 400 and is supplied to the trade either prime white in color or red as desired. Thorough tests of the product have been made over a considerable period. The product was devised to meet the requirements of the motorists who want a high grade motor fuel with anti-knock properties of a high degree and also a high general performance.

Contracts have been signed for a large quantity of benzol with leading manufacturers of this material and equipment added to the Riverside plant of the Acme company. The Riverside plant is located in the Chicago switching district.

INDIANA JOBBERS ELECT

CHICAGO, Dec. 17.—At the meeting of the Indiana Petroleum Marketers Association the following officers were elected; president, Phil T. Williams of the Williams Oil Co., Anderson; vice president, Bruce F. Gafill of the Gafill Oil Co., South Bend, and treasurer, Paul Deer of G. W. Deer & Sons, Crawfordsville. Sam Hurd was re-elected secretary.

LARGEST REFINERY IN WEST TEXAS

The accompanying photograph is a general view of the McCamey, Tex., refinery of the Humble Oil & Refining Co. This plant, which was built during the past summer, is the largest refinery in the West Texas area, having a capacity of 12,000 bbls. daily. The plant operates near capacity on crude obtained from the Crane-Upton Field.

Originally the refinery was a topping plant, the fuel oil residuum being sold to railroads and the tops being delivered to the Humble's trunk line to the Coast. Recently, however, through the installation of special towers finished gasoline is being refined for distribution in the West Texas area.

PHILLIPS ESTABLISHES BRANCH SALES OFFICES

The Phillips Petroleum Co., which recently purchased the refinery of the Alamo Refining Co. located at Borger, Tex., has established two branch offices for the sale of the refinery products. One of the district offices is located in the Amarillo Building at Amarillo, Tex., and the other in the City National Bank Building at Omaha, Neb.

O. W. Crick, who has been in charge of the Amarillo office for the Alamo Refining Co., will continue in that capacity for the Phillips company. Mr. Crick was formerly in charge of sales for the Highway Oil & Refining Co. at Tulsa. The Omaha office will be in charge of George M. Vance, formerly of the Bartlesville, Okla., office of the Phillips company. J. W. Hough has been employed as salesman for the Omaha office. He was formerly connected with the Tulsa sales office of the Johnson Oil & Refining Co.

The general refinery sales office of the Phillips company will be at Bartlesville, Okla. The same sales organization which has charge of natural gasoline sales will handle the refinery sales under the direction of H. A. Trower, sales manager.

The enlargement program for the Borger refinery is now under way. The present skimming capacity of 2,500 bbls. will be increased to 7,500 bbls. by March 1.

JOINS ROXANA STAFF

CHICAGO, Dec. 19.—Announcement has been made of the appointment of Theodore A. Peck as technical assistant to manager Ralph Matthews of the lubricating oil department of the Roxana Petroleum Corp. His office will be at St. Louis. Mr. Peck was until October of this year lubricating engineer and consulting technologist of the Independent Oil Men of America and had the same position with the National Petroleum Marketers Association. Before joining the staff of the latter organization he had been for some time with the Pierce Petroleum Corp., at St. Louis and had previously been associated with the Vacuum Oil Co.

KEYSTONE OIL REORGANIZATION

CHICAGO, Dec. 19.—The Keystone Oil & Manufacturing Co., a branch of the Central Commercial Co., has been reorganized and incorporated as the "Keystone Oil & Manufacturing Division of the Central Commercial Co., with a capital stock of $500,000. The members are Forest B. Lowery, Ward C. Pearl and C. A. Cosner. Mr. Lowery has been the head of the Central Commercial Co., with Mr. Pearl as manager of the Keystone Oil & Manufacturing Co., and Mr. Cosner of the Central Commercial Co. The offices are in the McCormick Building on Michigan Avenue.

GASOLINE TAX ARGUED

CHICAGO, Dec. 17.—The suit brought by the Chicago Motor Club which attacked the validity of the state gasoline tax was argued before the State Supreme Court at Springfield, December 16. Attorney for the motor club attacked the tax on various grounds. The court took the case under advisement.

JOINS BERRY'S SONS' CO.

CHICAGO, Dec. 17.—Harry McCormick recently of the McCormick-Foster Oil Co., has joined the forces of the James B. Berry's Sons' Co. as a general salesman.

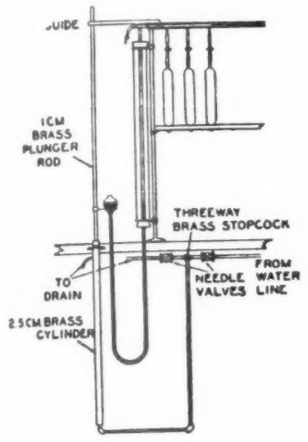
Brief Items for Plant Operators

Devise Hydraulic Lift for Apparatus In Analysis of Gas

By E. J. Tauch*

Department of Chemical Engineering, Massachusetts Institute of Technology, Cambridge, Mass.

A simple and flexible device for mechanically raising and lowering the mercury bulb of a gas analysis apparatus, or other apparatus in which mercury is used for displacement, is shown in the accompanying diagram. It is especially useful where a large number of analyses must be made, or where the operator must give most of his time to the control of other apparatus. The only attention required is an occasional shift of a stopcock lever and the leveling and reading of the mercury level between absorptions.



Water pressure supplies the operating power, raising and lowering a plunger which carries the bulb support. With the three-way stopcock in one position, water flows into the cylinder and raises the plunger until the overflow pipe is reached. During this upstroke the gas to be analyzed has been forced into one of the pipets. It will remain here until the three-way stopcock is shifted to the other position. The weight of the plunger and the mercury now forces the water out of the cylinder and into a drain, the gas being drawn back into the buret at the same time. This operation is repeated as many times as is desired by merely shifting the stopcock lever back and forth. When the absorption has been completed the mercury is leveled by moving the bulb up or down on the plunger rod.

The movement of the plunger is smooth and uniform. By moving the stopcock to an off position the plunger can be stopped during any part of the stroke. The speed of travel is readily controlled by two needle valves, one controlling the incoming water, the other the outgoing water. Once this adjustment is made it is necessary to operate only the stopcock to obtain a uniform motion. The mercury bulb can be set to a definite position on the plunger rod such that there is never any danger of forcing some of the mercury over into the pipets.

The brass cylinder should be about 2.5 cm. inside diameter. Its length will be determined by the length of the buret with which the apparatus is to be used. An additional allowance of about 15 cm. should be made for connections. A plunger rod about 1 cm. in diameter is sufficiently rigid. Its length should be such that, with the plunger at the bottom of the cylinder, the rod will project several centimeters above the guide. A cup-shaped leather washer, such as is used in an automobile tire pump, serves very satisfactorily as a plunger.

If desired, the device can be made entirely automatic in operation, with the exception of leveling and reading. A simple mechanism for shifting the stopcock lever at the end of each stroke, either mechanically or electrically, can be constructed for this purpose.

The hydraulic lift not only eliminates the work of raising and lowering the heavy mercury bulb, but it also gives more accurate results in analysis because of more consistent operation. There is always a tendency to raise and lower the bulb too rapidly when this must be done by hand. The resulting irregular pressure differences increase the error resulting from any small leaks which may be present in the apparatus.

The lift is particularly useful in making combustion analyses, in which a very slow and uniform flow of gas into the combustion pipet is desirable. The needle valves, for this use, can be adjusted to give an almost imperceptible motion of the plunger.

Its performance in practice has proved so successful that it has been installed on all fixed gas analysis apparatus in this laboratory.

*Republished from Industrial and Engineering Chemistry, published by the American Chemical Society.

SUSPEND HEARING

ST. LOUIS, Mo., Dec. 16.—Hearings on depositions in the suit of the Universal Oil Products Co. against the Standard Oil Co. of Indiana were suspended today until January 9. The case involves the alleged infringement of patents in the operation of the Burton cracking process by the defendant company.

Government Bureau Reports on Motor Fuel Performance

George K. Burgess, director of the Bureau of Standards at Washington, D. C. has summarized the year's work at the governments laboratories. A variety of problems relating to efficiency in motor car operation are included in these investigations.

One of these involved a study of the performance characteristics of journal bearings when a fine abrasive was in the lubricant, a condition similar to that resulting from the presence of road dust and other solid matter in the crankcase oil of automobile engines.

Under severe operating conditions, road dust in the lubricant of an automobile will considerably increase friction losses, while at very light loads but little difference will noted, according to the results of this investigation.

Another vital subject investigated was that of antiknock testing methods. There was no effort made to decide which methods gave accurate or concordant results but the survey was made to show the present status of the number and kinds of methods used.

This survey shows the need for some standard methods of measuring the antiknock value of fuels and some means of correlating the data obtained by existing methods which are usually not independent of test conditions.

Nearly all the methods investigated consist of engine tests, or rely on engine tests for their interpretation, and most of them involve a standard of knock intensity. Knock intensity is most commonly estimated by ear or by using a device known as the Midgley bouncing-pin-knock-indicator. Optical indicators and other devices are also used.

Gasoline Volatility

The question of ease of starting the motor has also been investigated and the bureau finds that so far as starting the engine is concerned, aside from volatility there is no appreciable difference between "cracked" and "straightrun" gasolines.

Gasolines produced by various cracking processes frequently are superior to gasolines obtained by straight distillation from crude petroleum so far as knocking in an engine is concerned. Information has not been available, however, as to the relative merit of these two types of gasolines in engine starting. The bureau was requested to carry out experiments to supply the needed information.

Experience indicated that the difference between gasoline of equal volatility was probably too small to be readily detected by engine starting experiments and therefore a more sensitive laboratory method was employed. The important factor in engine starting is the time required to build up an explosive mixture in the engine cylinders. Thus the leanest explosive mixture is to a certain extent a criterion of engine starting.

This limiting mixture was determined by flowing known mixtures of air and superheated fuel vapor into a glass bomb and by varying the proportion of air to fuel until the flame would just propagate throughout the entire bomb when a spark was applied. Mixtures containing 25 parts of air and 1 part of fuel vapor were found to be the leanest explosive mixtures for both cracked and straight-run gasoline.

Practically the same results were found for benzol. These results indicate that aside from volatility there are no

(Continued on Page 138)

AMONG THE TECHNICAL MEN

Robert C. Beckstrom, head of the Department of Petroleum Engineering, Colorado School of Mines, has combined his theoretical study and teaching with practical phases of petroleum research.

Robert C. Beckstrom

Going to the Colorado School of Mines in September, 1923 after spending three years at the University of Oklahoma, he greatly enlarged the scope of the Department of Petroleum Engineering.

Professor Beckstrom was born at Axtell, Neb., September 22, 1888. After receiving his primary and high school education in Nebraska, he became a school teacher, but after a short experience in Wyoming schools entered the petroleum industry in the Central Wyoming Field. After getting practical experience he entered the University of Oklahoma, receiving his A.B. degree in 1921 and his Master's in 1922, and was then made acting head of the Department of Petroleum Technology for the following year.

Since joining the Colorado School of Mines as head of the Department of Petroleum Engineering, he has conducted considerable research work, having equipped the laboratory with a complete working model refinery.

His original research on flooding depleted wells with alkaline solutions has also attracted considerable attention in the producing branch of the oil industry. In addition to this work, he takes an active part as a member of the American Chemical Society and American Petroleum Institute. He is also a fellow in the Wyoming-Colorado Academy of Science and a first lieutenant in the Chemical Warfare Reserve.

DIXIE TO OPERATE OLD PLANT AT SHREVEPORT

SHREVEPORT, La., Dec. 20.—Shreveport's seventh refinery will be placed in operation some time in March when Dixie Oil Co., a Standard Oil Co. of Indiana subsidiary, completes repairs and additions to an old plant at Superior, a siding on the Kansas City Southern Railroad a few miles north of Vivian. The refinery was built five or six years ago by the Paramount Refining Co., but operated only a short while.

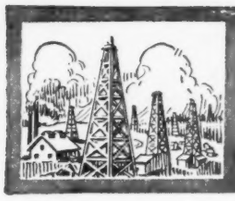
When the present work is completed it will be operated as a topping plant with about 2,400 bbls. daily capacity running the Dixie company's and outside production delivered by a short pipe line to the Pine Island district about 15 miles southeast of Superior.

REFUSE TO MOVE PLANT

SAN ANTONIO, Tex., Dec. 17.—The Grayburg Oil Co. of this city has disregarded the notice from city officials of San Antonio to remove its refinery from the city limits. The city is preparing to go into court and ask for an injunction against the operation of the refinery inside the city limits.

The controversy between the city and the Grayburg company started two years ago. The refinery which has been operating for several years adjoins one of the newer residential sections. Residents have objected to the refinery due to the plant fumes. The company was notified to remove the refinery and the time limit has now expired.

It is said that if the city endeavors to enjoin the further operation of the refinery a new legal question will be brought to the attention of the courts of the state of Texas.



REFINERY AND CRUDE PRICES

Quotations on Principal Refined Products and Crude Petroleum Markets in All the American Oil Fields

GASOLINE AND NAPHTHA

	Dec. 20		Dec. 13		Dec. 6	
OKLAHOMA (Group 3)—						
50-52 450 endpoint	.05⅝		.05⅝		.05¾	
56-58 450 endpoint	.05⅝		.05⅝		.05¾	
58-60 450 endpoint	.05⅝	.05¾	.05⅝	.05¾	.05¾	
58-60 437 endpoint (U. S. Motor)	.05¾	.06	.05⅞	.06⅛	.06	.06⅛
60-62 400 endpoint	.06⅜	.06½	.06⅜	.06½	.06½	
64-66 375 endpoint	.06⅞		.06¾		.06¾	
68-70 360 endpoint	.07⅛		.07⅛		.07⅛	.07¼
64-66 437 endpoint (blend)	.05⅞	.06	.06		.06	.06¼
KANSAS—						
58-60 437 endpoint (U. S. Motor)	.06⅛	.06¼	.06⅛	.06⅜	.06¼	.06⅜
NORTH TEXAS—						
56-58 450 endpoint	.05⅝		.05⅝		.05¾	
58-60 450 endpoint	.05⅝		.05⅝		.05¾	
58-60 437 endpoint (U. S. Motor)	.05¾	.06	.05⅞	.06⅛	.06	.06⅛
60-62 400 endpoint	.06⅜	.06½	.06⅜	.06½	.06½	
64-66 390 endpoint	.06½	.06⅝	.06½	.06⅝	.06⅝	
64-66 375 endpoint	.06⅞		.06¾		.06¾	.07
68-70 360 endpoint	.07	.07⅛	.07		.07	
64-66 437 endpo nt (blend)	.05⅞	.06	.06⅛		.06¼	
NORTH LOUISIANA—						
58-60 437 endpoint (U. S. Motor)	.06½		.06½		.06½	
ARKANSAS—						
58-60 437 endpoint (U. S. Motor)	.06⅜		.06½		.06½	
PENNSYLVANIA—						
52-54 Naphtha	.07¾	.08	.07¾	.08	.07¾	.08
54-56 Naphtha	.07¾	.08	.07¾	.08	.07¾	.08
58-60 Gasoline	.08	.08¼	.08	.08¼	.08	.08¼
60 Gasoline	.08¾	.09	.08¾	.09	.08¾	.09
62 Gasoline	.09¼	.09½	.09⅛	.09¼	.09¼	.09¼
64 Gasoline	.09¼	.09½	.09¼	.09½	.09¼	.09½
CALIFORNIA—						
58-60 437 endpoint (U. S. Motor) domestic	.10	.10¼	.10	.10¼	.08½	.09
CHICAGO DISTRICT (Based on Group 3)—						
50-52 450 endpoint (Naphtha)	.05¾		.05⅝	.05⅞	.05¾	.05⅞
56-58 450 endpoint	.05¾		.05¾	.05⅞	.05¾	
58-60 437 endpoint (U. S. Motor)	.05¾	.06	.05¾	.06	.06	.06⅛
60-62 400 endpoint	.06⅜	.06½	.06½		.06½	.06⅝
64-66 375 endpoint	.06¾	.07	.06¾	.07	.06⅞	.07
68-70 360 endpoint	.07⅛	.07⅜	.07¼	.07⅜	.07¼	.07⅜
64-66 437 endpoint (blend)	.06	.06⅛	.06	.06⅛	.06⅛	.06¼

NATURAL GASOLINE

	Dec. 20		Dec. 13		Dec. 6	
OKLAHOMA (Group 3)—						
Grade A, 72-79.9, 375 e.p., rec. 90%	.05⅛	.05¼	.05⅜		.05½	.05⅝
Grade AA, 80-87.9, 375 e.p., rec. 90%	.04⅞		.05⅛		.05⅜	.05½
Grade B, 76-83.9, 375 e.p., rec. 85%	.04⅛	.04½	.04¼		.04⅜	.05
Grade BB, 84-92, 375 e.p., rec. 85%	.04⅛		.04¼		.04⅜	
Grade C, 80-92, 375 e.p., rec. 78%	.03⅞	.04	.04		.04½	
NORTH TEXAS—						
Grade A, 72-79.9, 375 e.p., rec., 90%	.05⅛		.05⅜		.05½	
Grade AA, 80-87.9, 375 e.p., rec. 90%	.04⅞	.05	.05	.05⅛	.05⅜	.05½
Grade B, 76-83.9, 375 e.p., rec. 85%	.04⅛		.04¼		.04⅜	.05
Grade BB, 84-92, 375 e.p., rec. 85%	.04⅛		.04¼		.04⅜	.05
Grade C, 80-92, 375 e p., rec. 78%	.03¾		.04		.04½	
NORTH LOUISIANA—						
Grade AA, 80-87, 375 e.p., rec. 90%	.05⅛		.05½		.05¾	
Grade BB, 84-92, 375 e.p., rec. 85%	.05⅛		.05¼		.05½	
Grade C, 80-92, 375 e.p., rec. 78%	.04¾	.04⅞	.05		.05¼	
CALIFORNIA—						
75-85, 375, 390 endpo nt	.08½	.09	.08½	.09	.08½	.09
CHICAGO DISTRICT (Based on Group 3)—						
Grade A, 72-79.9, 375 e.p., rec. 90%	.05⅛		.05¼	.05⅜	.05½	
Grade AA, 80-87.9, 375 e.p., rec. 90%	.04⅞		.05⅛		.05⅜	.05½
Grade B, 76-83.9, 375 e.p., rec. 85%	.04⅛		.04¼		.04¾	.04⅞
Grade BB, 84-92, 375 e.p., rec. 85%	.04⅛		.04¼		.04¾	
Grade C, 80-90, 375 e.p., rec. 78%	.03¾		.04		.04½	

Note: All natural gasoline, except California, is noncorrosive.

BURNING OIL

	Dec. 20		Dec. 13		Dec. 6	
KANSAS—						
41-43 water white Kerosene	.04½	.04⅝	.04⅝	.04¾	.04¾	
OKLAHOMA (Group 3)—						
41-43 water white Kerosene	.04¼	.04½	.04⅜	.04½	.04⅜	.04⅝
42-44 water white Kerosene	.04¾	.05	.05		.05	
NORTH LOUISIANA—						
41-43 prime white Kerosene	.05		.05	.05¼	.05	.05¼
NORTH TEXAS—						
41-43 water white Kerosene	.04¼	.04½	.04⅜	.04½	.04½	
40-42 water white Kerosene	.04⅛	.04¼	.04½		.04¼	
ARKANSAS—						
41-43 water white Kerosene	.05		.05		.05	.05⅛
PENNSYLVANIA—						
43 Kerosene prime white	.06⅛	.06⅜	.06⅛	.06⅜	.06⅜	.06⅝
45 Kerosene water white	.06¼	.06½	.06¼	.06½	.06½	.06¾
46 Gerosene water white	.06½	.06¾	.06½	.06¾	.06¾	.07
47 Kerosene water white	.07	.07¼	.07	.07¼	.07	.07¼
300 Mineral Seal	.07¼	.07½	.07¼	.07½	.07¼	.07½
CALIFORNIA—						
38-40 water white Kero. (high burning test)	.05½	.06	.05½	.06	.05½	.06
Engine distillate, 43-45, 445 endpoint	.07	.07¾	.07	.07¾	.07	.07¾
Engine distillate, 42-44, 480 endpoint	.06¾	.07	.06¾	.07	.06¾	.07
CHICAGO DISTRICT (Based on Group 3)—						
41-43 water white Kerosene	.04¾	.04½	.04½	.04⅝	.04½	.04⅝
42-44 water white Kerosene	.04¾	.05	.05	.05⅛	.05	.05⅛

FUEL OILS

KANSAS—						
22-26 Fuel Oil	.80	.85	.80	.85	.80	.85
18-22 Fuel Oil	.80		.80		.80	
32-36 Gas Oil	.02½		.02½		.02½	
38-40 Distillate	.03¼	.03⅜	.03¼	.03⅜	.03¼	.03⅜
OKLAHOMA (Group 3)—						
Below 18 Fuel Oil	.70	.70	.70	.75	.70	.75
18-22 Fuel Oil	.75	.77½	.75	.77½	.75	.77½
22-26 Fuel Oil	.77½	.80	.77½	.80	.77½	.80
24-26 Fuel Oil	.80	.85	.80	.85	.80	.85
26-30 Fuel Oil	.85	.87½	.85	.87½	.85	.87½
28-30 Fuel Oil	.90	.95	.90	.95	.90	.95
32-36 Gas Oil (dark)	.02¼	.02⅜	.02¼	.03⅜	.02¼	.02⅜
32-36 Gas Oil (straw overhead)	.02⅜	.02½	.02⅜	.02½	.02⅜	.02½
36-38 Distillate	.03	.03¼	.03	.03⅛	.03	.03⅛
38-40 Straw Distillate	.03⅛	.03¼	.03⅛	.03¼	.03⅛	.03¼
NORTH TEXAS—						
24-26 Fuel Oil (sellers' cars)	.75	.80	.75	.80	.75	.80
32-36 Gas Oil (straw)	.02¼		.02¼		.02¼	
38-40 Straw Distillate	.03		.03		.03	
NORTH LOUISIANA—						
18-20 Fuel Oil	1.00		1.00		1.00	
32-36 Gas Oil	.03	.03¼	.03	.03¼	.03	.03¼
ARKANSAS—						
36-38 Distillate	.03¼	.03½	.03¼	.03½	.03¼	.03½
32-36 Gas Oil (straw)	.02¾		.03	.03¼	.03	.03¼
16-20 Refinery Fuel Oil	.95		.95	1.00	.95	1.00
GULF COAST (South Texas)—						
Gas Oil	.03⅞	.04	.03¾	.04	.03¾	.04
Fuel Oil	1.25	1.30	1.25	1.30	1.25	1.30
PENNSYLVANIA—						
30-34 Fuel Oil	.04¼	.04⅝	.04¼	.04⅝	.04¼	.04⅝
36-40 Fuel Oil	.04⅜	.04⅝	.04⅜	.04⅝	.04⅜	.04⅝
CALIFORNIA—						
33-36 Distillate	.03½	.03¾	.03½	.03¾	.03½	.03¾
27-32 Distillate	.02¼	.03	.02¼	.03	.02¾	.03¼
*15-20 Fuel Oil, Bunkers (at tide water)	1.00		1.00		1.00	
15-20 Fuel Oil (cargo lots)	.90		.90		.90	
27 plus Diesel	1.15	1.19	1.15	1.19	1.15	1.19
CHICAGO DISTRICT (Based on Group 3)—						
24-26 Fuel Oil (sellers' cars) Group 3	.80	.82½	.80	.82½	.80	.82½
22-26 Fuel Oil (sellers' cars) Group 3	.77½	.80	.77½	.80	.77½	.80
18-22 (Group 3)	.75	.77½	.75	.77½	.75	.77½
16-20 Smackover	1.00		1.00		1.00	
32-36 Gas Oil (zero)	.02¾	.02⅞	.02¾	.02⅞	.02⅝	.03⅛
32-36 Gas Oil (industrial)	.02½		.02½		.02⅝	.03
36-38 Distillate	.03⅛		.03¼		.03¼	.03¼
38-40 Straw Distillate	.03¼	.03⅜	.03¼	.03⅜	.03¼	.03⅜

*Bunkers.

LUBRICATING OIL AND WAX

	Dec. 20		Dec. 13		Dec. 6	
OKLAHOMA (Group 3)—						
100 vis., 2 color, 20-25 cold test	.06¼	.06½	.06¼	.06½	.06¼	.06½
100 vis., 3 color, 20-25 cold test	.06	.06¼	.06	.06¼	.06	.06¼
150 vis., 3 color, 20-25 cold test	.08¼	.08½	.08¼	.08½	.08¼	.08½
150 vis., 4 color, 20-25 cold test	.08	.08¼	.08	.08¼	.08	.08¼
180 vis., 3 color, 23-28 cold test	.09⅜	.10	.09⅜	.10	.09⅜	.10
180 vis., 4 color, 23-28 cold test	.09¼	.09⅜	.09¼	.09⅜	.09¼	.09⅜
180 vis., 5 color, 23-28 cold test	.09⅛	.09½	.09⅛	.09½	.09¼	.09½
200 vis., 3 color, 23-28 cold test	.09½	.10½	.09½	.10½	.09½	.10½
200 vis., 4 color, 23-28 cold test	.09⅜	.10¼	.09⅜	.10¼	.09⅜	.10¼
200 vis., 5 color, 23-28 cold test	.09¼	.10	.09¼	.10	.09¼	.10
240 vis., 3 color, 25-30 cold test	.13⅜	.14	.13⅜	.14	.13⅜	.14
240 vis., 4 color, 25-30 cold test	.13¼	.13½	.13¼	.13½	.13¼	.13½
240 vis., 5 color, 25-30 cold test	.12¼	.12½	.12¼	.12½	.12¼	.12½
280 vis., 3 color, 25-30 cold test	.15½	.16	.15½	.16	.15½	.16
280 vis., 4 color, 25-30 cold test	.15	.15½	.15	.15½	.15	.15½
280 vis., 5 color, 25-30 cold test	.14	.14½	.14	.14½	.14	.14½
Cylinder Stocks:						
600, steam refined, light green	.08	.09½	.08	.09½	.08	.09½
600, steam refined, dark green	.07	.07½	.07	.07½	.07	.07½
190-200 vis. @ 210 Bright Stock	.30	.32	.30	.32	.30	.32
150-160 vis. @ 210 Bright Stock	.24	.25	.24	.25	.24	.25
Waxes:						
124-126 White Crude Scale Wax	.02½	.02⅝	.02½	.02⅝	.02½	.02⅝
PENNSYLVANIA—						
34 Neutral	.07½	.07¾	.07½	.07¾	.07½	.07¾
34 Sundebloom	.07¾	.08	.07¾	.08	.07¾	.08
36 Miners' Neutral	.07½	.07¾	.07½	.07¾	.07½	.07¾
150, 3 color	.26½	.27	.26½	.27	.26½	.27
180, 3 color	.31	.31½	.31	.31½	.31	.31½
200, 3 color	.32	.32½	.32	.32½	.32	.32½
220, 3 color	.34½	.35	.34½	.35	.35½	.35
600, steam refined	.09¼	.09¾	.09¼	.09¾	.09¼	.09¾
635, steam refined	.10½	.11	.10½	.11	.10½	.11
650, steam refined	.11¼	.11¾	.11¼	.11¾	.11¼	.11¾
600, Pennsylvania flash	.15	.16	.15	.16	.15	.16
*550, E filtered	.15¾	.16	.15¾	.16	.15¾	.16
*600, E filtered	.16½	.17	.16½	.17	.17	.17½
600, E filtered	.15½	.16	.15½	.16	.15½	.16
600, D filtered	.24½	.25	.24½	.25	.24½	.25
550, E filtered	.15½	.16	.15½	.16	.15½	.16
550, D filtered	.21½	.22	.21½	.22	.21½	.22
Pennsylvania Bright Stock	.28	.28½	.28	.28½	.28	.29
†122-124 White Crude Scale Wax	.02⅞	.03	.02⅞	.03	.02¾	.02⅞
124-126 White Crude Scale Wax	.02⅞	.03	.02⅞	.03	.02⅞	.03

*At Warren, Pa. †At New York City.

GULF COAST (South Texas)—						
No. 2 color, 100 vis., pale oil	.06¼	.07	.06¼	.07	.06¼	.07
No. 3 color, 200 vis., pale oil	.08¾	.09	.08¾	.09	.08½	.09½
No. 3 color, 300 vis., pale oil	.10	.10½	.10	.10½	.10	.10½
No. 3½ color, 500 vis., pale oil	.11½	.12	.11½	.12	.11½	.12
No. 4 color, 750 vis., pale oil	.14	.14½	.14	.14½	.14½	.15
No. 5 to 6 color, 200 vis., red oil	.07½	.08	.07½	.08	.07½	.08
No. 5 to 6 color, 300 vis., red oil	.08½	.09	.08½	.09	.08½	.09
No. 5 to 6 color, 500 vis., red oil	.09½	.10½	.09½	.10½	.09½	.10½
No. 5 to 6 color, 750 vis., red oil	.12	.12½	.12	.12½	.12½	.13
No. 2 color, 200 vis., pale filtered	.11½	.12½	.11½	.12½	.11½	.13
No. 2 color, 300 vis., pale filtered	.13	.13½	.13	.13½	.13	.13½
No. 2½ color, 500 vis., pale filtered	.14	.14½	.14	.14½	.13½	.13½
No. 2½ color, 750 vis., pale filtered	.17½	.19	.17½	.19	.17½	.19

REFINERY AND CRUDE PRICES

Quotations on Principal Refined Products and Crude Petroleum Markets in All the American Oil Fields

CALIFORNIA—						
130 vis., 2½-3 color	.09	.10	.09	.10	.09	.10
200 vis., 2½-3 color	.10	.10½	.10	.10½	.10	.10½
300 vis., 3-3½ color	.10½	.11	.10½	.11	.10½	.11
350 vis., 3½-4 color	.11	.12	.11	.12	.11	.12
400 vis., 3½-4 color	.13	.14	.13	.14	.13	.14
Red Neutral:						
200 vis., 4½-5 color	.08½	.09	.08½	.09	.08½	.09
300 vis., 5-6 color	.09	.09½	.09	.09½	.09	.09½
400 vis., 5-6 color	.11	.11½	.11	.11½	.11	.11½
500 vis., 4½-5 color	.11¼	.12	.11¼	.12	.11¼	.12
500 vis., 5-6½ color	.11	.11½	.11	.11½	.11	.11½
600 vis., 6 plus color	.12	.12½	.12	.12½	.12	.12½

Note: Bright stocks are not manufactured commercially on the Pacific Coast.

NEW YORK (BAYONNE) REFINERY PRICES

	Dec. 20	Dec. 13	Dec. 6
Gasoline, U. S. Motor, 58-60 437	.08¼	.08¼	.08¼
Kerosene, water white, 41-43	.07½	.07½	.07½
*Fuel Oil, bunker "C," 14-16, per bbl.	1.35	1.35	1.35
*Fuel Oil, Diesel, 28-30, per bbl.	2.10	2.10	2.10
Gas Oil, 28 plus	.05½	.05½	.05½
25 pale Paraffin Oil	.12	.12	.12
28 pale Paraffin Oil	.07	.07	.07¼
285 red Paraffin Oil	.11½	.11½	.11½
250 red Paraffin Oil	.10½	.10½	.10½
225 red Paraffin Oil	.09½	.09½	.10
200 red Paraffin Oil	.09	.09	.09½
Refined Wax:			
120-122 a.m.p., per lb	.03⅞	.03⅞	.03⅞
125-127 a.m.p., per lb.	.03⅞	.03⅞	.04
130-132 a.m.p., per lb.	.04½	.04½	.04¾
135-137 a.m.p., per lb.	.05¼	.05¼	.05½
Petrolatum, in bbls., carload lots, per lb.:			
Dark green	.01⅞	.01⅞	.01⅞
Amber	.03⅜	.03⅜	.03⅜
Extra amber	.03¾	.03¾	.03¾
Cream	.06½	.06½	.06¼
Lily white	.08½	.08½	.09

*Lighterage 6.5c a barrel extra.

NEW YORK (BAYONNE) EXPORT PRICES

	Dec. 20	Dec. 13	Dec. 6
Gasoline, U. S. Motor, 58-60 437, in cases.	.2390	.2390	.2390
Kerosene, standard white, in cases	.1715	.1715	.1715
Kerosene, water white, in cases	.1815	.1815	.1815
600 steam refined cylinder stock, in bbls.	.17	.17	.17
635 steam refined	.19	.19	.19
650 steam refined	.20	.20	.20
600 Pennsylvania flash	.23	.23	.23
630 Pennsylvania flash	.35	.35	.35
600 Warren E	.25	.25	.25
600 Oil City E	.24	.24	.24
Light 135 Bright Stock	.40	.40	.40
Dark 135 Bright Stock	.38	.38	.38

LOS ANGELES EXPORT PRICES

	Dec. 20		Dec. 13		Dec. 6	
Kerosene, water white	.04½	.04¾	.04½	.04¾	.04½	.04¾
U. S. Motor Gasoline, 53-55 437 endpoint	.06	.06⅛	.06	.06⅛	.06	.06⅛

CALIFORNIA CRUDE PRICES

Standard Oil Co.-Union Oil Co. (Effective April 1, 1927)*

Gravity—	Fullerton, Seal Beach, Long Beach, Huntington Beach, Richfield, Rosecrans-Dom'guez, Torrance-Inglewood 1	Whittier, La Habra, Montebello 2	Kern River, Newhall-McKittrick, Midway-Sunset, Elk Hills, Lost Hills, Belridge, Buena Vista Hills 3	Coyote 4	Santa Fe Springs 5	Coalinga 6	Wheeler Ridge 7	Santa Maria, Ventura, Orcutt, Salt Lake 8
14°	.85	.85	.75	.85	....	.75	.75	.85
15°	.85	.85	.75	.85	....	.75	.75	.85
16°	.85	.85	.75	.85	....	.75	.75	.85
17°	.85	.85	.75	.85	....	.75	.75	.85
18°	.85	.85	.75	.85	....	.75	.75	.85
19°	.85	.85	.75	.85	....	.75	.75	.85
20°	.85	.85	.77	.85	....	.76	.76	.85
21°	.86	.85	.79	.86	.85	.77	.77	.85
22°	.87	.85	.81	.87	.85	.78	.78	.85
23°	.88	.85	.83	.88	.85	.79	.79	.85
24°	.89	.85	.85	.89	.85	.80	.80	.85
25°	.90	.86	.87	.90	.86	.81	.81	.86
26°	.92	.87	.89	.91	.87	.83	.82	.87
27°	.94	.88	.91	.92	.88	.85	.83	.88
28°	.96	.89	.93	.93	.89	.87	....	.89
29°	.98	.90	.96	.94	.91	.89	....	.91
30°	1.00	.91	.99	.95	.93	.91	....	.93
31°	1.03	....	1.02	....	.95	.93	....	.95
32°	1.06	....	1.05	....	.97	.95	....	.97
33°	1.09	....	1.08	....	.99	.97	....	.99
34°	1.12	....	1.11	....	1.01	.99	....	1.01
35°	1.15	....	....	....	1.03	1.01	....	1.03
36°	1.18	....	....	....	1.06	....	....	1.06
37°	1.21	....	....	....	1.09	....	....	1.09
38°	1.24	....	....	....	1.12	....	....	1.12
39°	1.27	....	....	....	1.15	....	....	1.15
40°	1.30	....	....	....	....	....	....	....
41°	1.33	....	....	....	....	....	....	....
42°	1.36	....	....	....	....	....	....	....

*Column 1—Long Beach, Seal Beach and Huntington Beach crudes, 14 to 32 degrees, inclusive; Richfield and Fullerton, 14 to 30 degrees; Torrance and Inglewood, 14 to 28 degrees; Domingues, 24 to 42 degrees. Rosecrans crude ranges from 14 to 42 degrees, but only Union Oil Co. posts below 24 degrees.

Column 2—Whittier crude, 14 to 22 degrees; Montebello, 14 to 30 degrees.

Column 3—Kern River, Newhall and McKitrrick, 14 to 19 degrees; Midway-Sunset, Buena Vista and Elk Hills, 14 to 33 degrees; Lost Hills and Belridge, 14 to 34 degrees.

Column 8—Salt Lake, 14 to 19 degrees, inclusive; Santa Maria, 14 to 30 degrees; Ventura and Orcutt, 14 to 39 degrees. Posted only by Union Oil Co.

CRUDE OIL GRAVITY TABLE

Gravity—	Okla., Kans., N. C. Tex., La.-Ark. 1	Smackover, Ark. 2	Stephens, Ark. 3	Gray County 4 (Texas Panhandle)	Crane, Upton, Pecos, Crockett Counties 5 (West Texas)	Salt Creek, Wyo. 6	Grade B & Light Crude (G. Coast) 7	Somerset (South Central Texas) 8
Below 24	....	.85	....	....	....	....	....	....
24 and above	....	1.00	....	....	....	....	....	....
Below 25	....	....	....	....	....	....	1.16	....
25 to 25.9	....	....	....	....	....	....	1.17	....
Below 26	....	....	....	....	.60	....	....	....
26 to 26.9	....	....	....	....	.60	....	1.19	....
27 to 27.9	....	....	....	....	.60	....	1.21	....
Below 28	(*)	....	1.00	....	....	....	....	....
28 to 28.9	1.12	....	1.02	.80	.60	....	1.23	....
29 to 29.9	1.14	....	1.04	.82	.60	1.14	1.25	....
30 to 30.9	1.16	....	1.06	.84	.60	1.16	1.27	....
31 to 31.9	1.18	....	1.08	.86	.60	1.18	1.29	....
32 to 32.9	1.20	....	1.10	.88	.60	1.20	1.31	1.05
33 to 33.9	1.22	....	....	.90	.60	1.22	1.33	1.07
34 to 34.9	1.24	....	....	.92	.60	1.24	1.35	1.09
35 to 35.9	1.26	....	....	.94	.60	1.26	1.37	1.11
36 to 36.9	1.28	....	....	.96	.60	1.28	....	1.13
37 to 37.9	1.30	....	....	.98	....	1.30	....	1.15
38 to 38.9	1.32	....	....	1.00	....	....	....	1.17
39 to 39.9	1.34	....	....	1.02	....	....	....	....
40 to 40.9	1.36	....	....	1.04	....	....	....	....
41 to 41.9	1.38	....	....	1.06	....	....	....	....
42 to 42.9	1.40	....	....	1.08	....	....	....	....
43 to 43.9	1.42	....	....	1.10	....	....	....	....
44 to 44.9	1.44	....	....	1.12	....	....	....	....
45 to 45.9	1.46	....	....	....	....	....	....	....
46 to 46.9	1.48	....	....	....	....	....	....	....
47 to 47.9	1.50	....	....	....	....	....	....	....
48 to 48.9	1.52	....	....	....	....	....	....	....
49 to 49.9	1.54	....	....	....	....	....	....	....
50 to 50.9	1.56	....	....	....	....	....	....	....
51 to 51.9	1.58	....	....	....	....	....	....	....
52 and above	1.60	....	....	....	....	....	....	....

Column 1—Magnolia Petroleum Co. posted new schedule September 14, making price below 30 gravity $1.05 per barrel, with 2 cents increase per degree higher in gravity, taking 30-30.9 gravity at $1.16 as basis, with a top price of $1.60 for 52 and above.

Oklahoma—Prairie Oil & Gas Co., Sinclair Oil & Gas Co., Gypsy Oil Co., March 12; Carter Oil Co., The Texas Company, March 14.

North Central Texas—[Including Ranger, Mexia, Powell, Richland, Wortham, Lytton Springs (Southwest Texas), Iatan and Panola (Magnolia only), Currie, Nocona, Moran and Corsicana light]; Texas, Prairie, Sinclair and Gulf, March 12; The Texas Company, Humble Oil & Refining Co., March 14.

Kansas—Prairie, Sinclair, March 12; Carter, Texas, March 14.

Arkansas and North Louisiana—[Caddo, Bull Bayou, Crichton, De Soto, Haynesville, Homer and El Dorado only]; Standard Oil Co. of Louisiana, March 14; The Texas Company, March 14; Magnolia Petroleum Co., Pine Island, Haynesville and Bull Bayou, El Dorado, Gulf Pipe Line Co., March 14.

Column 2—November 19, Louisiana Oil & Refining Co. On November 31, Standard Oil Co. of Louisiana, Magnolia Petroleum Co., Gulf Refining Co., and Atlantic Producing Co.

Column 3—Atlantic Oil Producing Co., March 14.

Column 4—Humble Oil & Refining Co. and Gulf Pipe Line Co., March 14. On August 23 Magnolia Petroleum Co. posted flat 75 cents.

Column 5—Humble Oil & Refining Co., August 23; Kay County Gas Co., Magnolia Petroleum Co., and Gulf Pipe Line Co., August 24.

Column 6—Midwest Refining Co., March 12. All crude over 37 gravity, $1.30 per barrel.

Column 7—Humble Oil & Refining Co. and other major buyers (schedule ends "35 and above"), March 14, with exception of Magnolia Petroleum Co., which stops at 31 degrees gravity. Sun Pipe Line Co. posts 2 cents differential for each degree above 35 gravity and $1.47 for 40 gravity and above.

Column 8—Grayburg Pipe Line Co. and Pioneer Oil & Refining Co., April 7.

*Prices for crude below 28 gravity: Oklahoma, Kansas and Texas, Magnolia Petroleum Co., $1.10, March 12; Arkansas, North Louisiana, March 14. Other companies, 2 cents less for each degree, with exception of Humble Oil & Refining Co., which pays 90 cents for crude below 25 degrees gravity, effective November 16.

CRUDE OIL PRICES

OKLAHOMA, KANSAS, NORTH AND EAST CENTRAL TEXAS

*Corsicana heavy (March 14, 1927)....$1.00
Other fields.....See gravity table

*Posted by Magnolia Petroleum Co.

TEXAS PANHANDLE

*Carson County .....$ .75
*Hutchinson County ..... .75
*Wheeler County ..... .75
Gray County.....See gravity table

*Hum'le Oil & Refining Co. Magnolia Petroleum Co., Gulf Pipe Line Co., and Kay County Gas Co., August 23.

*Iatan .....Same as North Texas
Crane-Upton-Crockett.....See gravity table
†Glasscock .....$ .80

*Includes Howard County and Westbrook Fields. Kay County Gas Co. pays $1.05 for Howard County crude, effective May 21.
†Magnolia Petroleum Co., Oct. 24.

ARKANSAS-NORTH LOUISIANA

Cotton Valley (Dec. 2) .....$ .85
Bellevue (Feb. 24, 1927) 1.25
Urania (Nov. 18, 1927) ..... .75
East El Dorado (Sept. 20) ..... .90
Other fields.....See gravity table

Note—Cotton Valley and Bellevue, Standard Oil Co. of Louisiana, Louisiana Oil Refining Co., Gulf Refining Co. and Magnolia Petroleum Co.; Urania, Louisiana Oil Refining Corp.; East El Dorado Magnolia Petroleum Co., Gulf Refining Co.

GULF COAST

(Goose Creek, Hull, Liberty, West Columbia, Orange, Boling, Sour Lake, Humble, High Island, Pierce Junction and Spindletop.)

‡Grade A (March 14) $1.20
Grade B .....See gravity table
*Jennings, La. (March 14).....$1.05
†Saratoga, Batson, Dayton (March 14, 1927) $1.20
§Markham (March 14) 1.00

*Gulf Pipe Line Co. †Sun Pipe Line Co. ‡Humble Oil & Refining Co. and other major buyers. §The Texas Company.

SOUTH CENTRAL AND SOUTHWESTERN TEXAS

*Luling (May 5) $1.00
†Mirando (March 14) 1.00
Rockdale-Minerva (April 15):
38-38.9 gravity 1.27
39-39.9 gravity 1.29
40 and above 1.31
*Thrall .....
Callihan (May 15) 1.75
Lytton Springs (Lockhart) See gravity table
Somerset .....See gravity table

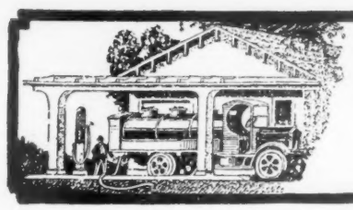
*Posted by Magnolia Petroleum Co. Thrall prices same as North Central Texas less 19½ cents per cwt. freight.
†Magnolia Petroleum Co., Humble Oil & Refining Co., Crown Central Pipe Line Co.

ROCKY MOUNTAIN STATES

Ohio Oil Co.-Midwest Refining Co.
(Effective March 14)

Rock Creek, Wyo (March 12).....$1.25
Salt Creek .....See gravity table
Big Muddy (March 12) $1.25
Mule Creek (May 1) 1.10
Grass Creek, heavy ..... .90
Grass Creek, light 1.33
Elk Basin (March 12) 1.33
Lance Creek (March 12) 1.33
Poison Spider 1.00
Notches ..... .65
Rex Lake (February 22) 1.10
Osage 1.33
Lost Soldier (contract) ..... .95
Greybull-Torchlight 1.33
Hamilton Dome ..... .85
Cat Creek (Mont.) 1.33
Sunburst (Mont.) 1.35

(Continued on Page 134)



TANK WAGON MARKETS

Tank wagon quotations for gasoline and kerosene in United States as furnished by the larger marketing concerns Dec. 20.

ALL TANK WAGON AND SERVICE STATION QUOTATIONS INCLUDE TAXES

STANDARD OIL CO. (INDIANA)

	Gasoline			Kero.
	Tank wagon	Service station	Incl'd's tax	tank wagon
Chicago dist.	16.0	18.0	2.0	12.0
Decatur, Ill.	13.5	12.5	2.0	12.1
E. St. Louis	15.1	17.35	2.0	11.2
Joliet	16.4	18.4	2.0	12.3
Peoria	12.2	12.2	2.0	12.1
Quincy	16.2	18.2	2.0	11.9
Davenport, Ia.	15.5	17.5	3.0	12.3
Des Moines	14.9	16.9	3.0	12.3
Keokuk	17.5	19.5	3.0	12.3
Sioux City	17.1	19.1	3.0	11.9
Duluth, Minn.	15.5	17.5	2.0	12.9
Minneapolis	14.0	14.0	2.0	12.9
Mankato	14.1	16.1	2.0	12.7
LaCross, Wis.	17.2	19.2	2.0	13.0
Milwaukee	16.1	18.1	2.0	11.9
Madison	16.3	18.3	2.0	12.1
Detroit, Mich.	15.8	17.8	3.0	13.7
Grand Rapids	14.0	16.0	3.0	13.6
Saginaw	17.9	19.9	3.0	13.8
Evansville, Ind.	17.0	19.0	3.0	13.0
Ft. Wayne	14.0	14.0	3.0	13.4
Indianapolis	14.2	15.2	3.0	12.2
South Bend	17.4	17.4	3.0	13.4
Fargo, N. D.	15.0	17.0	2.0	14.9
Huron, S. D.	19.5	21.5	4.0	13.9
Sioux Falls	15.0	17.0	4.0	13.4
*K. C., Mo.	14.9	16.9	3.0	10.6
*Springfield	16.8	18.8	3.0	11.5
*St. Louis	15.6	17.9	2.5	11.3
*St. Joseph	14.5	16.5	3.0	11.2
Wichita, Kans.	14.8	16.8	2.0	10.8
Bartlesville, Ok.	15.8	17.8	3.0	10.8

NAPHTHAS

	Tank wagon	Tank car
Oleum spirits	16.0	10.75
V. M. & P. naphtha	18.0	12.75
Cleaner's naphtha	18.0	13.75
Stanisol	19.0	

Tank wagon prices f.o.b. Chicago; tank car prices f.o.b. Whiting.

STANOLIND FURNACE OIL

Less than 100 gallons	9.0
100 to 349 gallons	8.0
350 or more gallons	7.5

Tank wagon prices of gasoline subject to discount of 1 cent a gallon on dumps of 50 gallons or more throughout territory except Chicago district where discount applies only to dumps of 100 gallons. Kerosene subject to 1 cent discount on dumps of 50 gallons or more.

Outside the Chicago district, the following quantity discount schedule is in effect on monthly tank wagon deliveries of gasoline; 6,000 gallons or more, 1½ cents; 10,000 gallons or more, 2 cents; 15,000 gallons or more, 3 cents. These discounts include the 1 cent allowed on dumps of 50 gallons or more at one delivery.

Within the Chicago district, the following quantity discount schedule is in effect on tank wagon deliveries of gasoline; 750 to 2,000 gallons, one-half cent; 2,000 to 3,000 gallons, three-fourths cent; 3,000 to 6,000 gallons, 1 cent; 6,000 to 10,000 gallons, 1½ cents; 10,000 to 15,000 gallons, 2 cents; 15,000 gallons or more, 3 cents. These discounts are in addition to the special discount of 1 cent on dumps of 100 gallons or more at one delivery.

If the quantity bought during the year is equal to or exceeds 12 times the agreed monthly quantity, the discount is paid or credited on the entire quantity at the close of the term less the monthly payments made during the year.

*State tax 2 cents; remainder city tax.

OHIO

Standard Oil Co. (Ohio)

	Gasoline			Kero.
	Tank wagon	Service station	Incl'd's tax	tank wagon
All Ohio points	17.0	19.0	3.0	14.5

SOUTHWESTERN DISTRICT

Magnolia Petroleum Co.*

	Gasoline			Kero.
	Tank wagon	Service station	Incl'd's tax	tank wagon
Dallas, Tex.	14.0	17.0	3.0	11.0
Fort Worth	14.0	16.0	3.0	10.0
Houston	13.0	15.0	3.0	15.0
San Antonio	13.0	15.0	3.0	10.0
El Paso	14.0	15.0	3.0	16.0
Texarkana	15.0	18.0	3.0	12.0
Muskogee, Ok.	15.0	18.0	3.0	10.0
Okla. City	13.0	14.0	3.0	10.0
Tulsa	13.0	14.0	3.0	10.0
Ft. Smith, Ark.	14.0	17.0	5.0	12.0
Little Rock	16.0	16.0	5.0	12.0

*The following is the schedule of discounts on quantity gasoline sales adopted by the Magnolia Petroleum Co. in Oklahoma: Over 750 gallons a month, one-half cent; over 2,000 gallons, three-quarters cent; over 3,000 gallons, 1 cent; over 4,500 gallons, 1¼ cents; over 6,000 gallons, 1½ cents; over 8,000 gallons, 1¾ cents; over 10,000 gallons, 2 cents. If the quantity bought during the year is 12 times the monthly agreed purchases, the discount will be paid or credited on the entire quantity for the year less any monthly purchases.

The schedule on service station deliveries is: Over 200 gallons a month, 1 cent; over 300 gallons a month, 1¼ cents; over 400 gallons, 1½ cents; over 500 gallons a month, 1¾ cents; over 600 gallons, 2 cents. The same rule applies for annual purchases in the tank wagon discounts.

CENTRAL SOUTH DISTRICT

Standard Oil Co. (Louisiana)

	Gasoline			Kero.
	Tank wagon	Service station	Incl'd's tax	tank wagon
*N. Orleans, La.	15.5	17.5	3.0	14.0
Baton Rouge	14.0	17.0	2.0	12.5
Alexandria	15.0	18.0	2.0	14.0
LaFayette	15.0	18.0	2.0	13.5
Lake Charles	15.5	18.5	2.0	14.0
Shreveport	15.5	18.5	2.0	13.0
Kn'xville, T'nn.	19.5	22.5	3.0	15.0
Memphis	15.0	16.5	3.0	14.0
Chattanooga	19.5	22.5	3.0	15.0
Nashville	18.0	21.0	3.0	15.0
Bristol	19.0	22.0	3.0	14.0
Lit. Rock, Ark.	16.0	16.0	5.0	12.0

*Tax of 3 cents includes city tax of 1 cent.
*Louisiana kerosene prices include 1-cent state tax and 1-cent parish tax.

SOUTHERN DISTRICT

Standard Oil Co. (Kentucky)

	Gasoline			Kero.
	Tank wagon	Service station	Incl'd's tax	tank wagon
Atlanta, Ga.	17.0	19.0	4.0	14.0
Augusta	19.0	22.0	4.0	16.5
Macon	19.0	22.0	4.0	13.5
Savannah	17.0	19.0	4.0	14.5
Birm'h'm, Ala.	18.0	21.0	4.0	15.5
Mobile	17.0	20.0	4.0	15.0
Montgomery	19.0	22.0	5.0	16.5
Clarks'le, Miss.	17.0	20.0	4.0	12.5
Jackson	17.0	20.0	4.0	13.5
Natchez	16.5	19.5	4.0	14.0
Gulfport	18.5	21.5	6.0	14.0
Wicksburg	16.5	19.5	4.0	14.0
Jack'ville, Fla.	18.0	21.0	5.0	11.5
Miami	20.0	23.0	5.0	15.5
Pensacola	19.0	22.0	5.0	14.0
Tampa	18.0	21.0	5.0	14.0
Lexington, Ky.	18.0	21.0	5.0	15.5
Covington	19.0	22.0	5.0	15.5
Louisville	18.0	21.0	5.0	15.0

In addition to the state tax of 4 cents on gasoline, Montgomery has city tax of 1 cent on gasoline. Kerosene prices in Georgia includes 1 cent tax. In Florida, an inspection fee of 0.125 cent; in Alabama, an inspection fee of one-half cent on kerosene only. Pensacola tax includes 1 cent city levy. Gulfport tax includes privilege tax of 2 cents in addition to state tax.

PENNSYLVANIA-DELAWARE AND PART NEW ENGLAND

Atlantic Refining Co.

	Gasoline			Kero.
	Tank wagon	Service station	Incl'd's tax	tank wagon
Pittsburgh, Pa.	16.0	*22.0	...	14.0
Philadelphia	15.0	21.0	...	14.0
Scranton	16.0	*22.0	...	14.0
Allentown	16.0	*22.0	...	14.0
Altoona	16.0	*22.0	...	14.0
Erie	12.0	*18.0	...	14.0
Dover, Del.	19.0	22.0	3.0	14.0
Wilmington	19.0	22.0	3.0	14.0
Spring'd, Mass.	18.0	18.0	...	15.0
Worchester	17.0	17.0	...	15.0
Boston	17.0	17.0	...	15.0
Providence, R.I.	19.0	19.0	2.0	15.0
Hartford, Conn.	20.0	20.0	2.0	15.0
New Haven	20.0	20.0	2.0	15.0

*Includes tax of 3.0 cents. Pennsylvania tax is collected by the dealer and paid by him direct to the state.

NEW YORK AND PART OF NEW ENGLAND DISTRICT

Standard Oil Co. (New York)

	Gasoline			Kero.
	Tank wagon	Service station	Incl'd's tax	tank wagon
Albany, N. Y.	17.0	19.0	...	15.0
*New York	17.0	19.0	...	15.0
Buffalo	17.0	19.0	...	14.0
Rochester	13.0	16.0	...	14.0
Syracuse	17.0	19.0	...	15.0
Boston, Mass.	17.0	19.0	...	15.0
Augusta, Me.	21.0	23.0	4.0	15.0
M'nch't'r, N.H.	18.0	22.0	3.0	15.0
Burlington, Vt.	20.0	22.0	3.0	15.0

*Price in steel barrels.

PACIFIC COAST DISTRICT

Standard Oil Co. (California)

	Gasoline			Kero.
	Tank wagon	Service station	Incl'd's tax	tank wagon
San Francisco	17.0	21.0	3.0	15.5
Pueblo	18.0	18.0	3.0	15.5
Los Angeles	16.5	20.5	3.0	15.5
Reno, Nev.	22.0	26.0	4.0	19.0
Portland, Ore.	17.5	21.5	3.0	16.5
Seattle, Wash.	16.5	20.5	2.0	16.5
Tacoma	16.5	20.5	2.0	16.5
Spokane	20.5	24.5	2.0	20.5
Phoenix, Ariz.	22.0	26.0	3.0	20.5

ATLANTIC COAST DISTRICT

Standard Oil Co. (New Jersey)

	Gasoline			Kero.
	Tank wagon	Service station	Incl'd's tax	tank wagon
Atlantic City	18.0	20.0	2.0	14.0
Newark, N. J.	18.0	20.0	2.0	14.0
Annapolis, Md.	20.0	23.0	4.0	12.0
Baltimore	20.0	23.0	4.0	10.0
Cumberland	20.0	23.0	4.0	14.0
Washington	18.0	21.0	2.0	12.0
Danville, Va.	20.5	...	4.5	14.0
Norfolk	20.5	23.5	4.5	12.6
Petersburg	20.5	23.5	4.5	14.0
Roanoke	20.5	23.5	4.5	14.0
Richmond	18.5	21.5	4.5	14.0
Ch'rslt'n, W.Va.	20.0	23.0	4.0	14.0
Keyser	20.0	...	4.0	14.0
Parkersburg	17.0	20.0	4.0	14.0
Wheeling	20.0	23.0	4.0	14.0
Charlotte, N. C.	20.0	23.0	4.0	14.0
Hickory	20.0	23.0	4.0	14.0
Mt. Airy	20.0	23.0	4.0	14.0
Salisbury	20.0	23.0	4.0	14.0
Charlst'n, S. C.	20.0	23.0	5.0	14.0
Columbia	20.0	20.0	5.0	14.0

NEBRASKA

Standard Oil Co. (Nebraska)

	Gasoline			Kero.
	Tank wagon	Service station	Incl'd's tax	tank wagon
Omaha	14.25	16.26	2.0	12.25
McCook	14.75	14.75	2.0	11.50
Norfolk	16.75	18.75	2.0	12.75
N. Platte	17.75	19.75	2.0	13.50
Scottsbluff	17.25	19.25	2.0	13.00

ROCKY MOUNTAIN DISTRICT

Continental Oil Co.

	Gasoline			Kero.
	Tank wagon	Service station	Incl'd's tax	tank wagon
Denver, Colo.	16.0	16.0	3.0	12.5
Pueblo	15.0	15.0	3.0	14.5
Grand Jnctn.	20.5	22.5	3.0	18.0
Casper, Wyo.	17.0	19.0	3.0	13.0
Cheyenne	18.0	20.0	3.0	14.5
Butte, Mont.	22.0	22.0	3.0	19.0
Helena	22.5	24.5	3.0	19.0
Salt L'ke, Utah	20.0	21.0	3.5	17.0
Boise, Idaho	23.5	25.5	4.0	19.0
Twin Falls	23.5	25.5	4.0	19.0
Albu'que, N. M.	21.0	24.0	5.0	17.0

TANK WAGON CHANGES

December 1—Standard Oil of Kentucky reduced the kerosene price 1½ cents to 14 cents at Atlanta, Ga., 3 cents to 13½ cents at Macon, Ga., and 2½ cents to 11½ cents at Jacksonville, Fla.

December 3—Standard Oil Co. of Kentucky increased the gasoline tank wagon and station prices 3 cents at Atlanta, Ga., making the new prices 17 cents and 19 cents respectively.

December 12—Standard Oil Co. of Indiana increased the gasoline tank wagon and station prices 1 cent in Des Moines, Iowa, making the new prices 14.9 and 16.9 cents.

December 13—Standard Oil Co. of Indiana increased the gasoline tank wagon price 3 cents at Decatur, Ill., to 13.5 cents.

CRUDE CHANGES

December 17—Joseph Seep Purchasing Agency increased the price of all grades of Pennsylvania crude 5 cents except that in the Buckeye Pipe Line Co.'s lines which was raised 10 cents per barrel.

December 19—Joseph Seep Purchasing Agency increased both grades of Corning crude 10 cents per barrel.

CALIFORNIA MARKETS REPORTED STEADYING

LOS ANGELES, Calif., Dec. 17.—There is a growing feeling among California oil marketers that present gasoline retail prices will continue during the winter. There has been and still is a certain amount of nervousness in this market but recent developments have been such that they have had a steadying rather than a disturbing effect. U. S. Motor gasoline for local consumption in tank car lots has shown a marked improvement during the past two or three weeks, prices stiffening sufficiently to affect the retail quotations of so-called bootleg gasoline. In most cases, service stations selling cut rate gasoline are quoted 2 cents under th eprice displayed at company-owned service stations. There are still some exceptions selling at a cheaper price but these are becoming less.

Gasoline is moving satisfactorily in the export trade. Demand from the Atlantic Seaboard is showing improvement. Sales in most cases, are still being made at 6 cents.

Export kerosene is holding steady at about 4¾ cents. The outlook for this market is gradually strengthening over the next few months. Prices are expected to improve. There has been no particular change in the lubricating oil market. Prices appear to be pegged at present levels with no signs of improvement. By far the largest portion of lub oil consumption is in automobiles, and no improvement is seen in the demand for this commodity for several months.

PENNSYLVANIA MARKET

OIL CITY, Pa., Dec. 17.—Little change in the refined market for Pennsylvania was noted during the week. Gasoline and naphtha were weak and demand was slight with actual consumption at a low ebb on account of weather conditions. Kerosene was in fair demand and prices were firm. Wax was stronger than had been the case. Fuel oil was unchanged. There was little demand for neutrals and no change in prices. Bright stocks were stronger. Cylinder stocks were without demand but the prices did not drop.

D. B. COGSWELL RESIGNS

D. B. Cogswell, formerly general credit manager for the Continental Supply Co. at St. Louis, has resigned to become associated with the Moody-Seagraves interests at Houston, Texas. Mr. Cogswell has been closely allied with the petroleum supply and equipment business for the past three years.

CRUDE OIL PRICES

(Continued from Page 133)

Artesia (March 12)	1.00
Hogback (N. Mex.) (March 14)	1.33

Note: Salt Creek, Osage, Cat Creek, Greybull and Hogback posted by Midwest Refining Co., and the remainder by the Ohio Oil Co. Both companies post Grass Creek light and Elk Basin.

EASTERN STATES

Joseph Seep Purchasing Agency
(Effective December 17)

Penna Grade Oil in New York Transit Line (New York)	$2.80
Bradford District Oil in National Transit Lines (Pennsylvania)	2.80
Penna Grade Oil in National Transit Lines (Pennsylvania)	2.65
Penna Crude Oil in Southwest Pennsylvan'a Lines (West Virginia)	2.65
Penna Grade Oil in Eureka Pipe Line lines (Pennsylvania)	2.60
Penna Grade Oil in Buckeye Pipe Line lines (Ohio)	2.35
Cabell Grade Oil in Eureka Pipe Line lines (West Virginia) (December 4)	1.50
Corning 35-cent grade oil in Buckeye Pipe Line Co.'s line (December 19)	1.45
Corning 25-cent grade oil in Buckeye Pipe Line Co.'s lines (December 19)	1.55
Somerset Oil in Cumberland Pipe Line lines (Kentucky) (December 4)	1.60
Ragland Grade Oil in Cumberland Pipe Line lines (Kentucky) (August 1)	.95
Keister (Pennsylvania) (August 1)	1.10

MIDDLE WESTERN STATES

Ohio Oil Co.
(Effective March 14)

Lima	$1.71
Wooster	1.57
**Saginaw, Mich., Saginaw Sand (May 27)	2.05
Illinois	1.60
Indiana	1.48
Princeton	1.60
Plymouth	1.33
Waterloo (Nov. 17, 1926)	1.35
*Western Kentucky	1.33
**Saginaw, Mich., Berea Sand (May 27)	1.95
†Cumberland, Clay, Barren, Clinton and Monroe Counties, Kentucky (March 16)	1.50
‡Oil in lines of Stoll Oil Refining Co. in Oil City, Ky. (March 16, 1927)	1.50
§Oil Springs (Canada)	2.18
§Petrolia (Canada)	2.11

*Posted by Ohio Oil Co.
†Posted by Paragon Development Co.
‡Posted by Stoll Oil Refining Co.
§Posted by Imperial Oil Co., Ltd.
**Posted by Sun Oil Co.

MEXICAN CRUDE

Note—Due to the fact that the exportation of Tuxpam light crude oil has become a negligible factor, prices will no longer be published.

*Panuco heavy (f.o.b. Mex. ports)	$1.15

*17.496 cents tax.

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Also Makers of Sinclair Gasoline and H-C Gasoline

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Oil Securities Generally Were Strong

Sinclair Most Interesting Issue of Week, Featured by Steady Buying. Some New High Marks Reached Monday

Sinclair furnished the most interesting issue during the past week when it touched 22¼. Steady buying featured this security when large blocks were offered and absorbed with small effort. On Monday the oils were higher and a few new high marks were registered for the close of 1927.

The strength of the oils was general and was confined to no single offering. Simms Petroleum continues its advance and marked 26¼, while Gulf Oil, a curb issue, touched 109¾, an advance of $10 within the past week.

Gladys Belle Oil Co.

Harrison S. Green, president of the Gladys Belle Oil Co., announced that on December 20 the company paid off the last of its old indebtedness. When Mr. Green took over the presidency of the company on June 1, 1925, he says the company owed $1,511,000. All of this now has been paid and the company still holds all of its old producing properties.

New Oil Companies

The New York Journal of Commerce compilation shows that the capitalization of oil companies organized under the laws of various states during November amounted to $23,550,000. This capitalization compares with $64,950,000 for the corresponding month a year ago.

The investment in oil companies over the respective periods is shown in the following tables:

1918	$2,134,547,000	1921	$1,255,657,00
1919	3,786,006,000	1922	1,157,972,000
1920	3,786,814,000	1923	962,403,840

1924—		
January	46	$127,728,000
February	48	56,095,000
March	40	61,465,000
April	53	94,124,000
May	42	34,315,000
June	33	20,574,000
July	31	57,135,000
August	26	67,475,000
September	37	143,695,000
October	39	37,575,000
November	27	33,260,000
December	22	56,590,000
Total		$787,031,000
1925—		
January	36	$49,720,000
February	19	45,607,000
March	39	62,175,000
April	36	158,810,000
May	27	123,300,000
June	37	29,847,000
July	23	37,689,600
August	30	72,875,000
September	29	34,575,000
October	43	73,788,000
November	78	437,210,000
December	23	273,445,000
Total		$1,890,726,000
1926—		
January	56	$56,363,000
February	39	37,870,000
March	37	32,592,000
April	59	117,574,000
May	31	114,811,000
June	38	73,316,000
July	34	40,334,000
August	43	119,100,000
September	34	34,108,000
October	34	34,108,000
November	17	64,950,000
December	31	98,405,000
Total		$1,562,396,000
1927—		
January	29	$19,252,000
February	40	58,400,000
March	39	30,167,500
April	33	15,940,000
May	28	16,220,000
June	57	35,679,000
July	36	9,640,000
August	18	12,835,000
September	38	210,951,000
October	26	20,015,000
November	40	23,550,000

Following is a list of new oil companies organized last month, giving state of incorporation and capitalization:

Auburn Coal & Material Co., Ill.	$100,000
Bagdad Oil Royalty Corp., Del.	500,000
Belmont Quadrangle Drilling Corp., N. Y.	100,000
Bergen Oil & Tar Products N., J.	100,000
Biltmore Coal & Land Co., N. C.	100,000
California Elk Hills Oil Co., Del.	200,000
Central Oil Co., Va.	50,000
Community Drilling Corp., Del.	225,000
Eureka-Barry Oil Corp., Del.	100,000
Evangeline Petroleum Corp., La.	50,000
Federal Petroleum Royalty Corp., Okla.	100,000
Flynn Oil Co., Del.	200,000
Gasoline Products, Inc., Conn.	50,000
Great Southern Oil Co., Tex.	50,000
Gran-Columbia Corp., N. Y.	250,000
Hamilton Gas Co., Del.	1,500,000
Hill Crest Production Corp., Del.	100,000
Italian-French Petroleum Holding Corp., N. Y.	250,000
Le Flore Coal Co., Del.	1,000,000
The Leue Oil Co., Del.	200,000
Lite Flower Oil Co., Mo.	250,000
Louisville Refining Co., Del.	500,000
Maratime Oil Corp., Del.	500,000
New York Novol Corp., Del.	100,000
The North Central Texas Oil Co. of Arkansas, Inc., Del.	100,000
North Dakota Oil & Development Co., Del.	500,000
Paull Oil Co., Del.	100,000
Perpetual Oil Royalty Corp., Del.	500,000
The Radigan-Hungerford Corp., Del.	300,000
Rich Oil Corp., Del.	250,000
Robinson Petroleum Products Corp., Del.	2,000,000
Stamford & Western Gas Co., Del.	100,000
Texland Oil & Gas Co., Del.	500,000
Triangle Oil Co., Conn.	50,000
Tri-State Oil Co., Del.	300,000
Tritex Oil Co., Del.	1,000,000
Union Gas Utilities, Inc., Del.	425,000
United Motor Fuel Corp. of Washington, Del.	750,000
Wirt Franklin Petroleum Corp., Del.	10,000,000
"Zip" Service, Inc., Del.	100,000
Total	$23,550,000

Washington Oil

The Washington Oil Co. has declared the regular quarterly dividend of $1 a share, payable December 20 to stockholders of record December 15.

California Petroleum

The California Petroleum Corp. has entered into an agreement on a royalty basis with the Woodburn Oil Corp., a subsidiary of Simms Petroleum Corp., and Venezuela Holding Corp. for acquisition of approximately 1,000 acres contiguous to the Caribbean Petroleum property in Venezuela.

The Union Oil Co. of California will join with the California Petroleum Corp. in the development of this acreage. The two companies have further pooled equal amounts of acreage held by them in this tract, totaling about 7,400 acres.

F. V. Gordon, vice president of the California Petroleum Corp., states:

"As soon as machinery can be placed on the ground, drilling of a joint well will be commenced on property acquired from Venezuelan Holding Corp. and offsetting Caribbean Petroleum property. Pantepec Petroleum will have 37½ per cent interest in this acreage."

"The Mene Grande Field, which, at its present stage of development, lies wholly within Caribbean Petroleum property, is one of the greatest oil fields in Venezuela. Recent developments have shown that production increases to the south and that depth of oil sand is decreasing, which would indicate another structural high within the boundaries of the Calcano "A" concession, held by these companies. The most southerly well in Mene Grande Field is reported capable of a production of 10,000 bbls.

"Complete drilling equipment is now being assembled and interesting results may be expected within the coming 12 months."

Apex Trinidad Oil

The Apex Trinidad Oilfields, Ltd., has declared a final dividend of 40 per cent for 1927, making 80 per cent for the year, and a bonus of one new share for every five shares held.

Mountain & Gulf

The Mountain & Gulf Oil Co. has declared an extra dividend of 1 cent and regular quarterly dividend of 2 cents a share on the common stock, both payable January 16 to stockholders of record December 31.

NEW YORK STOCK EXCHANGE—LIST OF ACTIVE STOCKS

Stocks—	Par	Clos. Quot. Dec.19	Dec.12	1927 High	Low	1926 High	Low	1925 High	Low
Amerada Corp.	..	30⅝	29⅝	37⅛	27⅝	32⅞	24¾	...	...
Atlantic Refining, com.	100	109½	108¾	131⅝	107	128⅝	97	117½	95¼
Barnsdall "A"	25	25½	25⅛	35½	20¾	32½	23½	33½	18¾
California Petroleum, com.	25	24½	23¼	32⅞	20	38⅛	30⅞	34⅞	23⅝
Houston Oil	100	161	159	175¾	60⅛	75	50¼	85	50
Independent Oil & Gas	..	26⅝	26	32⅜	17⅝	34	20¼	41⅜	13½
Louisiana Oil	10	10½	10⅜	18½	10½	19⅝	12	23⅝	13⅜
Maracaibo	..	15⅛	15¼	22¾	12	27¾	18⅜	35½	20¾
Marland	..	36⅛	33⅝	58¼	31	63⅜	41¼	60⅛	31⅝
Mid-Continent Petroleum	..	29¼	27⅝	39⅝	25½	41	25⅝	38	25¾
National Supply	50	92½	94¼	95⅜	76	84⅞	55½	71	54¾
Oil Well Supply	25	32½	32⅝	44⅜	31¼	36	30	38	33⅜
Pan American, B	50	42⅜	44⅞	66⅝	45½	72⅜	56⅛	83⅞	59⅛
Pan American, Western B	..	20⅝	19⅝	37⅞	16⅜	46	34	94⅞	37¼
Phillips Petroleum	..	41⅜	41½	60½	36½	54⅞	42½	47½	47½
Producers & Refiners	50	25½	25	33⅞	16⅜	26	11	32⅝	12½
Pure Oil, com.	..	26⅝	25⅜	33½	25	31	25⅜	33⅜	32½
Royal Dutch, N. Y., sh.	13.40	47⅛	47⅞	54½	44¼	57⅝	49⅜	57⅜	48¼
Shell Transport	10	42½	42⅝	49	41½	48⅞	42	49	30⅜
Shell Union, com.	..	25⅝	25⅝	31⅝	24⅝	30⅞	24	28⅝	21⅝
Simms Petroleum	10	26¼	23⅞	23⅞	14¼	25⅝	16½	28½	18¾
Sinclair Consolidated	..	20⅝	17⅛	22⅜	15¼	24⅞	16⅜	24⅞	17
Skelly Oil	25	27⅜	26	37⅜	24⅛	37¼	27	32½	21¾
Standard of California	25	55⅞	54⅜	60⅝	50⅜	63½	54	67¼	52½
Standard of New Jersey, com.	25	39⅝	39⅝	41⅝	35⅛	46⅝	37½	47½	38⅜
Standard of New York	25	31⅞	31½	34½	29¾	47¼	30⅝	48⅝	40
Sun Oil Co.	..	32⅛	30⅞	34⅞	30	41¼	30⅛	43⅞	38½
The Texas Company	25	53½	52⅞	68	45	58	48	55	43¾
Texas Pacific Coal & Oil	10	14½	13⅛	18⅞	12	19½	12⅛	23¼	11
Tide Water Associated Oil	..	17⅞	10½	19⅛	15⅜	21	17	...	...
Transcontinental	..	9⅜	9⅛	10⅜	3¾	5½	3	5⅝	3½
Union Oil of California	25	45⅞	42⅝	56½	39⅝	53⅝	37¼	43⅝	38½
Union Tank, com.	100	126	120	126	94	120⅝	84¼	‡134	118
White Eagle Oil & Refining	..	21⅛	21½	27½	21¾	29¾	25⅛	28⅝	25⅝
Standard Oils									
Anglo-American Oil	£1	15	19	21⅝	17⅛	19¾	16½	26¾	17½
Borne Scrymser	25	57	57	69	49½	75	65	‡240	205
Buckeye Pipe Line	50	56	57	59	45	59½	42	72	63½
Chesebrough Manufacturing Co.	25	117	119	126	76½	81⅛	63	74	48¾
Continental	10	19	18⅜	22⅝	16¼	25⅞	10¼	31⅛	21⅞
Cumberland Pipe Line	100	91	90	‡137	90	137	102	156	128
Eureka Pipe Line	100	65	66	66	47	43¾	43	96	61¼
Galena Signal, com.	100	3½	4½	13½	4½	32½	9⅞	68½	23½
Humble Oil & Refining Co.	25	67⅜	65⅝	67⅛	54	99⅝	52	99	40½
Illinois Pipe Line	100	178	178	181½	123¾	144	131	154½	124
Imperial Oil	..	59	60	64¾	37¾	39⅜	32⅛	39¼	27¼
Indiana Pipe Line	50	75	75	93	61	68	52¼	84	57⅛
International Petroleum Co.	10	36⅜	36¼	34⅞	28¼	35¼	28¾	25⅜	20⅛
National Transit Co.	12.50	21¼	20¼	23¼	13¼	30¾	27¼	25½	16½
New York Transit	100	38	38	42	31¼	61½	27¼	70	50
Northern Pipe Line	100	91	94	96	70	80½	64	88	67½
Ohio Oil Co.	25	66	65	66	52	67¾	55¾	75¼	60
Penn-Mex Fuel	25	33	32¾	36½	12	24¼	15	44	19
Prairie Oil & Gas	25	50⅛	48⅝	55½	45⅝	60¼	49	65½	45⅞
Prairie Pipe Line	100	189	184	189¼	132	137½	122½	129¾	105
Solar Refining Co.	100	175	175	‡201½	178	212	184½	259	200
South Penn Oil	25	37	37½	41⅜	34½	50	30	‡197	139
Southwest Pa. Pipe Line	100	74	73	78	55½	56	47½	84	50
Southern Pipe Line	50	21	21½	39	18½	27	34	‡103	63
Standard of Indiana	25	79¾	77¾	80¼	64⅝	70½	60½	70¾	69¼
Standard of Kansas	25	15½	15¼	20⅞	15⅝	36½	16½	45	30
Standard of Kentucky	25	122¼	122½	125⅛	111½	134⅜	107	137	114⅜
Standard of Nebraska	25	41	41½	49¼	43	51⅛	42	‡270	231
Standard of Ohio, com.	100	77	77	81½	72	362	192½	369	338
Swan & Finch, com.	25	18	18	21	14½	21	18	27	12
Vacuum Oil	25	143½	145	147	95⅛	109⅝	94⅛	109½	80½
Miscellaneous									
Gulf Oil Corp. of Pa.	25	108	101	109⅜	86¼	95	82½	98¼	63½

*Bid, no sales. ‡Old stock. †New stock. §Ex-dividend.

Quotations furnished by W. J. Wollman & Co.

The Oil and Gas Journal's weekly average price of 20 representative petroleum stocks listed on the New York Stock Exchange was as follows:

Dec. 19	63.24	Nov. 14	62.78	Oct. 10	59.20
Dec. 12	62.07	Nov. 7	61.30	Oct. 3	60.97
Dec. 5	62.06	Oct. 31	69.98	Sept. 26	61.30
Nov. 28	62.92	Oct. 24	60.45	Sept. 19	60.83
Nov. 21	63.65	Oct. 17	59.22	Sept. 12	61.20

GULF COAST MARKET HAS FIRMER UNDERTONE

HOUSTON, Tex., Dec. 20.—A firmer undertone was evident in the Gulf Coast lubricating oil market Monday and sellers were hopeful that after the Christmas holidays some relief would be received from the excessively low prices which have made profitable operations on the part of most of the refiners difficult. With one of the larger independent refineries shut down and another reported running only to cover existing contracts, others were expecting an increase in spot business to take care of their output.

While several large companies still are a dominating factor in the situation, this competition was not reflected so keenly the past week. Some increased demand for zero test from Gulf Coast crudes, occasioned by the extreme cold weather which has been sweeping the northern states is credited with the better feeling in the market.

However, the market the past week continued weak although there were no further reductions in prices. Prices now are thought to be at as low a mark as is possible on the present crude postings. Gas oil also reflected a firmer tone with an improved demand and very little material available. Several buyers were in the market, one seeking quotations on 84,000 gallons. Very little gas oil could be found under 4 cents Monday and one refiner was quoting 4½ cents. The latter refiners' product is an exceptionally desirable uncracked stock. The bulk of the business in tank car lots is being done at 4¼ cents. Fuel oil continued unchanged.

SHREVEPORT MARKETS SHOW SOME STRENGTH

SHREVEPORT, La., Dec. 19.—The holiday season is productive of only a slow market for refined oils in this territory, according to sales managers, although U. S. Motor gasoline is showing some signs of strength, which has been missing during the last few weeks. The largest refinery organization is quoting 6½ cents to 6⅝ and 6¾ with orders on its books sufficient to take care of production for the immediate future. This plant is the only one running kerosene and at present it is oversold. A half million gallon export contract at 4¾ to 5 cents signed two weeks ago accounting for the situation.

Gas oil is in fairly good demand with prices unchanged at 3 to 3¼ cents, both grades. The refiner quoted also reporting himself oversold on that product. Fuel oil is steady at $1 with a tendency to weaken again because of accumulating stocks though declining production of Smackover heavy oil may ease the situation or prevent a beggars' market in this territory.

PRODUCTION PRACTICES IN THE SEMINOLE FIELD

(Continued from Page 25)

them in the correct order of importance. The first two cause all of the rod and tubing trouble, while the last gives the working barrel a great deal of "grief." Motive power and power transmission give no more trouble than they do in any field, although all equipment must of necessity be heavy and designed for severe work.

During a recent survey of pumping operations in the Seminole City Field the writer obtained information from 10 of the leading producing companies in the area. These companies, at the time the survey was made, had 141 pumping wells out of 332 total producing wells, or 42.2 per cent. These 141 pumpers represented at that time about 83 per cent of the 170 pumping wells in the district outside of Earlsboro. These pumping wells were producing an average of 95 bbls. per day each, or about 15 per cent of the total production of the companies interviewed.

Down Time for Wells

Analysis of down time for the wells included in this survey indicates that the average Seminole pumping wells is down 8.55 per cent of its total possible pumping time, taking into consideration those wells that are not pumped a full 24 hours daily. This is equivalent to about 2.05 hours per well per day, representing a loss of 1,144 bbls. of oil per day, for the 141 wells at 95 bbls. per day each. Approximately 80 per cent of all down time investigated resulted from trouble with rods, cups and tubing, with rod breakage accounting for about one-half of this 80 per cent.

Of the wells included in the survey, 112 were using 2½-inch tubing, and 29 were equipped with 2-inch. Belief was generally expressed that the larger size was much better for these deep wells, and those companies using the smaller size tubing were replacing them with 2½-inch in many instances. Much experimentation has been done with rods, with the three-fourth inch size predominating. This size rod, usually with 1¼-inch pin, is used in 95 wells; 7 wells have five-eighths inch, 16 have seven-eighths inch, and 23 have combination strings of three-fourths and five-eighths inch. Where this combination string is used, the heavier rods are used on top, with about an equal amount of each size in the hole.

Beam pumping was being used on 118 of the wells investigated, the remaining 13 using geared units with electric motors. There were 41 wells being pumped with electric motors, including the 13 just mentioned, all the rest being equipped with gas engines, 123 of which were of 40 horsepower, the remainer being 35 horsepower. Average length of stroke was about 42 inches, and the average speed about 18 strokes per minute. Apparently those companies that used a long stroke with slow motion were getting the best results. Proper counterbalancing also has been found to be an important factor in successful pumping, reducing as it does the lash of the rods caused by sudden changes in direction of stroke.

Crooked Holes

Crooked holes are chiefly to blame for the excessive amount of rod trouble in Seminole pumping wells, and it is no reflection on the rods themselves when the severe conditions under which they must operate are taken into consideration. Crooked holes cause the rods to wear in two against the tubing, and also cause much trouble through causing the rods to unscrew, this being about as frequent a source of trouble as breakage. Contact of rods against the tubing not only wears the rods, but also is very detrimental to the tubing, and this is a frequent cause of trouble. The use of rod guides has been resorted to to some extent, but they apparently do not help much. An instance of this was found in one well which must be just about the crookedest of all the crooked holes in the field. This well was equipped with 100 sucker rod guides, out of a total of 178 joints of rods in the hole, the guides being placed where inspection had shown that the rods and tubing were in contact. In spite of this precaution, the tubing was found to be worn thin in five places were no guides had been set.

At the time this survey was made, 49 per cent of all Seminole district wells were on air-gas lift, and they were accounting for 71 per cent of the total production. Natural flowing wells, 9 per cent of the total, were making 19 per cent of the output; swabbing wells, 10 per cent in numbers, were making 6 per cent of the output; and pumping wells, 22 per cent of the total number of wells, were making only 4 per cent of total field production. Average production per well by the various methods at that time was as follows: Natural flow, 910 bbls.; air-gas lift, 625 bbls.; swab, 242 bbls.; pump, 77 bbls. Daily average production for all wells in the district was 433 bbls.

PROMOTING OF HEALTH IN THE NEW OIL FIELDS

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the family physician for a checking up regularly each birthday, aside from any immediate attention found necessary.

Commenting upon her use of the word "parent," Miss Mueller said: "Every now and then a father comes with his family, sometimes accompanying his wife and sometimes coming alone when the mother is unable to come. They always are appreciative and we wish more fathers would come. Perhaps they will when they realize what we are finding in these examinations. For instance, 47 children have been examined at the Grisso school and Carter Oil Co. Community Hall. Of this number all had one or more physical defects, the total number being 283, an average of 6 to a child. One child had 23 defects. Two-thirds of these handicaps could be fully overcome by school age, many simply by proper care and nourishment and most of the others by a moderate amount of professional attention."

Miss Mueller has been in the Seminole Field about three months and she has the co-operation of the school authorities, local physicians and members of large oil companies. She is receiving the active assistance of the wives of men who hold responsible places in various oil companies operating in the district. "Save the youngest" is their slogan, Miss Mueller says, but she points out that no opportunity is lost to extend the gospel of wholesome living to the older members of oil-field families, with the result that the tone of the whole community's health life is heightened.

YATES POOL YIELD MOST ECONOMICAL

(Continued from Page 22)

but the field has rapidly been lined with a network of roads, two of which cost $10,000 each. There was a time when the distance by road between two offset locations was said to have been 17 miles but that period has passed. The Roxana Petroleum Corp. has an excellent road up the side of the mountain on its Tippett lease and the California Co. has also constructed an expensive one, which shortens distances. Considering the number of locations which these roads serve, however, the cost per well is very small.

Cost of Drilling

In regard to the cost of drilling, here are some actual figures as prepared by one of the large companies: One well which came in for 3,570 bbls. at a total depth of 1,270 feet has 642 feet of 8-inch pipe and 1,044 feet of 6-inch, the total cost of drilling having been $5,090. Another has 100 feet of 12-inch, 290 feet of 10-inch and 932 feet of 8-inch casing, and a total drilling cost of $3,000. It was also a big well. Still another gusher has 310 feet of 10-inch, 440 feet of 8-inch and 1,098 feet of 6-inch, costing $5,000 for the drilling. These cost figures do not include putting the well on production but the complete expense of an average well, including well fittings, flow tanks, separator and its share of the overhead is probably no greater than $15,000.

Among the drilling difficulties should be listed the shallow gas. This is found in some wells at depths as shallow as 300 feet.

Lifting Costs

Concerning the matter of lifting costs and upkeep of producing wells, it is interesting to note that seven wells on the Mid-Kansas & Transcontinental's "B" lease are handled by two men on each tour. These wells are Nos. 3, 4, 5, 6, 9, 15 and 16. On the same companies' "A" lease, also, Nos. 1, 2, 3, and 9 are handled by two men. Of course, isolated producers require a regular crew to each well but most of these flow enough crude each day or two to pay the crew's wages for a month, even with oil at 60 cents a barrel.

Storage in Field

Something was said above concerning the small amount of storage in the Yates Pool. Following is a list of all tanks in the field above the 1,000-bbl. size:

Illinois P. L. Co. at Station 1	4	55,000
Humble P. L. Co. at Pecos Station	2	55,000
Humble O. & R. Co. on "A" lease	1	55,000
Simms Oil Co. on Smith lease	3	55,000
California Co. on Yates-1 lease	1	55,000
California Co. on Yates-1 lease	9	5,000
California Co. on Smith lease	4	5,000
Roxana Pet. Corp. on Tippett lease	2	80,000
Roxana Pet. Corp. on Tippett lease	1	5,000
Gulf Prod. Co. on School Land	2	10,000
McMan & Marland on Yates lease	1	5,000

The Illinois Pipe Line Co., of course, has two 55,000-bbl. at McCamey and the Gulf Production also has two 80,000-bbl. at its loading rack near the same town, while the Mid-Kansas Oil & Gas Co. has twenty-five 80,000-bbl. tanks at Del Rio.

MISSISSIPPI OIL MEN AT MERIDIAN ORGANIZE

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conservation department, defining its powers, prerogatives, etc., to be submitted to the next Legislature, meeting in January.

A. M. Sutton, one of the first wildcatters to enter the state after the Amory gasser and who is now drilling at Corinth, was elected president; Hayes Brummett, who was instrumental in interesting the Natural Gas & Fuel Corp. owners of the second commercial well in the state, in Mississippi, is first vice president; Charles L. Tubb, whom Mississippians and the operators now engaged there credit with having finally induced development, is second vice president; Jerry Whalen of the Ohio Oil Co., who has been in Mississippi for the past year for the company, and Harry Hodges of Fayette, Ala., also are vice presidents. F. N. Henderson, on whom has fallen most of the labor of getting the operators, landowners, bankers and skeptical legislators and the population in general to see the light, is secretary-treasurer.

Meeting Encouraging

On the whole, those attending the convention, and they numbered bankers, wildcatters, landowners, lease men, business men, arrived with a feeling that they were about to accomplish something for the good of the entire state and left with the conviction that they had. Also with the assurance that they will have a cordial reception when they come to the Legislature asking for measures protecting the interests of themselves and the state. The executive committee of the association is composed of Jerry Whalen of the Ohio Oil Co., C. M. Whitman, attorney of Mendenhall, Simpson County; Charles L. Tubb of Amory, who caused to be drilled one of the first wells in the state and who was "in" on the Amory discovery well; Harry Hodges of Fayette, Ala., blocking acreage in northwest Alabama; R. S. Withers, geologist of Jackson, Miss.; Clint Vinson of Meridian, drilling in Lauderdale County; B. M. Blanquist of the Gulf Refining Co., who, like Whalen, has been quietly busy in northeastern Mississippi for the past year; W. W. McDonald, geologist for the Natural Gas & Fuel Corp., of El Dorado, Ark.; S. F. Hill, John Cobb and G. N. Knapp of Alabama, the latter a widely known geologist; Eugene Sykes, banker, of Aberdeen, Miss., interested in several wildcats now drilling, and F. N. Henderson.

Regular meetings of the association will be held quarterly upon designation of the executive committee, with Columbus, Miss., as the location for the first, to be held the second Tuesday in April, 1928. No action was taken on the urgent invitations of Gulfport, Miss., and Birmingham, Ala., to hold the next annual meeting—in January—there, or on their invitations for the next quarterly meetings although the session Tuesday morning recommended that the first quarterly meeting be held in Columbus, Miss., in April, the second at Gulfport in July and the third and annual in Birmingham. Gulfport will probably get the mid-summer meeting and Birmingham the annual Columbus' invitation for the first quarterly meeting was accepted for the reason that there will probably be 15 to 20 wildcats drilling in that territory by next April.

Development Plans

At least the meeting was told there will be that many and Brummett and DeMontrond advised that they plan eight locations, four of which are financed. It was also intimated by the representative of one of the major companies having considerable acreage in the Lee-Monroe-Lowndes County area that his company will drill in the near future. In this connection the interesting and somewhat illuminating statement was made that 128 wells have been drilled in Mississippi, so far as it has been possible to ascertain, and over $11,000,000 has been invested and spent in the state by major companies and independents. There are 28 now drilling. Two have been completed as small but still commercial gassers and a third has had two oil showings, the last at 1,700 feet, and now drilling at around 1,800 feet. The statement was made and reiterated by several speakers that few of these 128 wells have failed to develop showings of oil and gas.

NEBRASKA OIL MEN HOLD CONVENTION

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plish this, there must be more co-operation among ourselves."

Intelligent Salesmanship

One of the speakers of the first day's session was James A. Gilmore, secretary of the American Oil Men's Association. His subject was "Intelligent Salesmanship." In part Mr. Gilmore said:

"Intelligent salesmanship requires that you know your product so well that you are completely sold on it yourself and your prospective customer simply cannot fail to react favorably. It requires no intelligence to sell any product at a loss. One of the greatest tragedies of the oil business is the sales effort expended to obtain gallonage without profit. Any fool can give his stuff away and after he goes broke doing it, he still will be a fool."

Mr. Gilmore declared intelligent salesmanship is summed up in six "P's"—the Power to Persuade People to Purchase your Product at a Profit."

Coupon Interchange

Paul Hadlick, secretary, Minnesota Petroleum Association, spoke on "Coupon Interchange Among Members of Minnesota Petroleum Association." He called upon jobbers in the industry to "wake up" and characterized them as "lazy and unthinking." He told of the co-operative exchange of coupon books among members of the Minnesota association.

Following Mr. Hadlick's address, the convention for half an hour discussed the subject in open forum, there being many both for and against the proposition. Many of the members said they found it almost impossible to sell coupon books because the customers would rather open a charge account than to pay in advance for a coupon book. One member had placed 20 young men and women from a college out selling books, giving them each five books to sell. At the end of six days intensive effort, seven coupon books had been sold, he told the convention. Those in favor of the coupon books declared they cut down overhead expense

and saved bookkeeping. No formal action was taken at the meeting.

The installation of free equipment to insure greater gallonage sale, regardless of whether the sales are made at a loss, was another subject discussed at the open forum. Everybody was against the practice.

In answer to many questions from the floor as to how the association stood on the matter of gasoline tax for road building purposes, President Milder announced that while the association favors the building of paved roads, it stands neutral on the matter of gasoline tax. A resolution to the effect that the association go on record for an increase in the tax was one of the violently debated question of the convention. The association finally voted to remain neutral.

Addresses were also given by Robert Bruce White, sales manager of the Valvoline Oil Co., on "Modern Automobile Lubrication" and Arthur Anson, president of the Altitude Petroleum Co., of Tulsa, Okla., on "Economic Basis of Refiner-Jobber Relation."

S. A. Wassum, Tekamah, Neb., was elected president for 1928. He succeeds Morris Milder of Omaha, who refused to stand for re-election.

C. C. Rosenberg, Lexington, Neb., and R. H. Steinmeyer, Beatrice, were elected vice presidents. New directors are Ray Ogier, North Platte, and Kile R. Martin, Pilgar.

ROCKY MOUNTAIN OIL AND GAS MEN HOLD MEETING

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sociation can best represent all of the interests in the oil business, including the royalty holders, and that adequate representation can and will be given him if he will come into our organization and aid us to present his viewpoint."

To Name Committee

In accordance with the report of the producers' group of the chapter, a committee of five will be appointed to meet with the state board of equalization to discuss assessments on oil field property.

It was voted that there be an executive committee of five in which the various groups will be represented.

Mr. Henderson made an oral report for the refiners' group to the effect that at the group meeting "all agreed that the refiners have been operating at a loss the past year."

The first address of the morning program was a discussion on "Lubrication and Lubricating Oils" by F. R. Staley, chief chemist of the Texas Pacific Coal & Oil Co. Then W. H. Price, district manager of Black, Sivalls & Bryson, Casper, Wyo., spoke on "Tankage Problems and Conservation."

V. E. Wilhelm, geologist for the California Petroleum Corp., Los Angeles, was the next speaker. Mr. Wilhelm's presentation of the subject "Lime and Sand Production," was considered one of the most valuable contributions to the convention program. He used maps to illustrate his remarks, pointing out the structural conditions and operating experiences in the California fields, of which he has wide knowledge.

M. C. Henderson of Great Falls was elected president of the Montana Chapter with four new vice presidents, LaRue Smith of Great Falls; C. H. Brown and A. E. O'Brien of Lewistown and John O'Neil of Sunburst. Walter Brittan of Great Falls was re-elected secretary and T. B. Campbell of Great Falls was chosen treasurer. Five new directors were chosen: Lew Sontag, L. R. Hannah, G. C. Stevenson, James A. Johnson and H. B. Chesser.

TEXAS PANHANDLE

(Continued from Page 32)

ews was junked at 2,550 feet and is being abandoned.

Archer County

Jeffers & Jeffers' No. 1 Andrews-C was temporarily abandoned at 940 feet. Staley, Wynne & Co.'s No. 1 Seay was dry and abandoned at 1,553 feet. The Texas Company's No. 1 Seay was dry and abandoned at 1,556 feet. Weldon & Lowry's No. 1 Cuba was dry and abandoned at 1,495 feet.

Haskell County

Edmunston & Critton's No. 1 Reynolds was dry at 2,503 feet and is being plugged.

Young County

The Texas Company's No. 1 Stowe made 13 bbls. of oil and 2 bbls. of water initially from sand at 1,077 80½ feet. Atkins & Sandefer's No. 2 Donnell was dry at 2,295 feet and is being plugged. Jacobs' No. 1 Weldon was dry at 4,548 feet and is being plugged. Pardee's No. 1 Donnell made 60 bbls. from lime at 3,353-72 feet. Paull Oil Co.'s No. 4 Morrison pumped 75 bbls. from 2,221-31 feet. Westerfelt & Noble's No. 8 Graham-B is flowing 150 bbls. after being drilled deeper to 3,460 feet.

Wichita County

Henry Hobbs' No. 2 Watkins is a 24-bbl. pumper at 1,523-25 feet. The Texas Company's No. 333 W. T. Waggoner was dry and abandoned at 2,222 feet.

Ranger District Completions

Brown County

Adamson and Bearman's No. 2 Miller made 4,000,000 feet of gas at 1,129-45 feet. Dozier's No. 1 Evans was dry and abandoned at 1,420 feet. Russell and associates' No. 1 Turner was abandoned at 470 feet. Selby Oil & Gas Co.'s No. 23 Ellis made 650 bbls. initially from 1,333-50 feet. Stock and Love's No. 1 Graham estate was dry and abandoned at 2,055 feet. Elam and associates' No. 1 Brownwood was dry and abandoned at 1,600 feet. Van Bibber and Lehman's No. 4 Evans is making 10 bbls. of oil and 20 bbls. of water from sand at 690-93 feet.

Callahan County

Empire Gas & Fuel Co.'s No. 1 Snyder made 45 bbls. initially from 926-29 feet; 19 bbls. the second 24 hours and 17 bbls. the third 24-hour perior. Forrest Oil Corp.'s No. 1 McDermitt was dry and abandoned at 1,710 feet. Mook-Texas Oil Co's No. 2 Baum was plugged back from 1,743 feet to 1,717 feet; shot wth 18 quarts at 1,684 to 1,710 feet and made 40 bbls. initial.

Coleman County

Roth and Faurot's No. 2 Sealy and Smith is making 4,000,000 feet of gas with 565 pounds rock pressure from 2,-916-18 feet. Gladys Belle Oil Co.'s No. 9 Pope was dry and abandoned at 1,607 feet.

Comanche County

Humphrey Brothers' No. 1 Barnes was dry and abandoned at 3,361 feet.

Eastland County

Latchshaw and associates' No. 1 Harbin made 25 bbls. initially from 1,496 to 1,516 feet. Lightfoot and associates' No. 2 Earnest is an abandoned location. Magnolia Petroleum Co.'s No. 1 Pettit was dry and abandoned at 1,333 feet. Belva Oil Co.'s No. 1 Good was plugged back to 3,700 feet and made 180 bbls. initially from 3,692-98 feet. Chestnut and Smith Corp.'s No. 1 Griggs made 40 bbls. initially after a 160-quart shot at 2,970 to 3,035 feet. Milham Corp.'s No. 1 Barnett was temporarily abandoned at 2,865 feet. Same company's No. 2 Barnett is a location temporarily abandoned.

Palo Pinto County

French and associates' No. 1 Taylor was dry and abandoned at 1,485 feet. Chestnut and Smith Corp.'s No. 1 Hart is an abandoned location.

Stephens County

Barnhart and Conway Brothers' No. 1 Gardenhire was dry and abandoned at 2,075 feet. Clark's No. 2 Riddle is flowing 135 bbls. from 1,860-73 feet and may be drilled deeper.

GOVERNMENT BUREAU REPORTS ON MOTOR FUEL

(Continued from Page 131)

appreciable differences between the various kinds of motor fuels so far as engine starting is concerned.

Recent tests show that a considerable difference in jacket water temperature has but slight effect on car acceleration, but warming the intake manifold does help the engine's ability to pick up speed very materially. A change in the jacket water temperature from 212 to 54 degrees Fahrenheit appeared to have little effect, but a change in intake manifold temperature from 160 degrees Fahrenheit to 172 degrees Fahrenheit made a marked improvement in acceleration. Additional tests show the effect on acceleration of air fuel ratio, initial engine speed, and the injection of an accelerating charge.

REPRESSURING AND TREATMENT OF OIL

(Continued from Page 21)

Taking a broad glance at the graph a wide distinction in gravities may be noted. The right hand side of the graph illustrates that the majority of oil which was run had an average gravity of 40 degrees, while the left hand side of the graph indicates that the oil run had an average gravity of 42.6 degrees. When the oil on the right hand side of the graph was run, the treating apparatus was not in use, and the ordinary methods of production were employed. The installation of the specially designed equipment was completed during the first half of September, 1925, with the corresponding result of increased gravity. From that time on there may be noticed a steady increase in the gravity of the production.

The entire treating apparatus for this lease was designed and installed at a cost of approximately $7,300 and according to data kept on the proceeds of the oil sold, the profit resulting from this equipment amounted to $35,000 the first year the equipment was in place. This statement shows a splended profit resulting from an investment in modern engineering skill, and gives further evidence of the trend among progressive oil companies to take the fullest advantage of technical training in the producing and operating of oil properties.

Mr. Hall's Paper

Mr. Hall's paper entitled, "Some Problems Affecting the Application of Repressuring," follows:

In this paper it will be endeavored to give a few remarks on application of repressuring to such areas as the shallow fields of northern Oklahoma and southern Kansas. The remarks will be governed by the experience of the Tidal Oil Co., who is now active in rejuvenating old production in this area by this method commonly known as the Marietta process. Only a few general statements on our present status will be made, as follows:

On October 31, of this year, we estimate that we have an increase of about 600 bbls. of oil above that which might be expected by ordinary methods of producing oil. The total new investment necessary for repressuring these properties amounted to nearly $500,000 at the above date. This shows a cost of approximately $800 per barrel increase. The return on this investment amounts to nearly $200,-000 per year or at the rate of nearly 40 per cent annual return on the investment. The above figures, although not exciting, show promise of being worth while after considering that these properties had been shut down during the summer and are not up to normal production by about 100 bbls., besides the handicap of low prices. In general, it may be said that we are encouraged with the results to date.

The above-mentioned shutdown consisted of very lightly pumping the wells, but the compressors continued to force air into the sand. At the present time we cannot say as to the success of this method of shutdown for although the production shows evidence of returning to its former rate without much difficulty some properties have developed casing leaks and money must be spent to recondition them.

So much for the present and past and now, after bearing in mind that our experience is limited in the time and variety of conditions, it will be attempted to give a brief outline on application of repressuring. The remainder of this paper will be divided into three parts, namely:

1. The selection of the property to be repressured.
2. The selection of key wells.
3. Notes on repressuring procedure.

Selection of Property

The size and number of producing oil wells on the property is not as serious in limiting the desirability of applying pressure as was formerly figured. However, it is an advantage to own and control a large number of producing wells in one block, for the reason that the larger the number, the cheaper the cost per unit to equip; also it is more simple and efficient when not necessary to consider one's neighbors. In general, it can be said that a property may be considered as an individual repressuring proposition if a few wells are owned where at least one is an inside location, providing this inside location is within a reasonable distance from one or more of the line wells, say, for instance, within 900 feet as an approximate limit. In the case where no inside locations are operated, it still has value as a prospective pressure property in a co-operative proposition. From now on, for simplicity's sake, it will be considered that a fairly large number of wells, say, for example, 30 or more wells, are held in one block and operated by one company. These wells will be assumed to be producing from the same formation and are to be given consideration for repressuring possibilities. An attempt will now be made to list the most important considerations to be made when examining this hypothetical property in view of applying pressure:

1. During the past, what has been the expelling force which caused the oil to migrate into the wells? Gas or water under pressure are the only two forms of natural energy that need be considered. Of these two forms of natural energy, water is the most undesirable. Therefore, if a property is being flushed by water at the present time, it is considered as being undesirable for the application of pressure, unless the rate of the water encroachment is very slow. Therefore, we assume that natural gas under pressure has been the force aiding the recovery of oil.

2 The amount of expelling force originally in the reservoir and how efficient this force has been utilized during the past history of the production. Of course the amount of past energy that has been released means nothing unless it has been made to bring oil into the well. We may be able to make a reasonable approximation of the past efficiency of the recovery if production records are available which show the amount of oil taken from the reservoir and well records showing the approximate thickness of the pay. Then by making an approximation of the oil originally in the reservoir by the volumetric method and by knowing the amount produced we can get an idea of the richness of the remaining pay sand. If these figures show a low yield of, say, up to 20 per cent, we know that it is going to be easy to show results by repressuring, unless other conditions are badly against it.

Expelling Force

3. The present expelling force. The present oil-gas ratio should be considered and if high, a careful study be made to find out if it is not likely that an expected gas sand is not responsible, otherwise it might indicate a porous gas sand grading into a less porous oil sand which might make it impossible to get worthwhile results with pressure. In the case of the exposed gas sand, care should be taken to be sure that it can be located. If the gas sand is in the oil-bearing horizon, say between oil pays, it might be hard to handle unless better than the average well records were made at the time the wells were drilled. Should the oil-gas ratio be low, it might be due to water encroachment and should be given study, as stated before, for unless the water is moving slowly, the recovery of oil might not be increased either in rate or amount.

4. **Sand Characteristics.** Most of our experience has been with the Bartlesville sand, therefore we are inclined to com-

pare other sands to this sand. Knowing that in general this sand has responded to repressuring, it is only logical to do this. Thus, if any sand is comparable to the Bartlesville sand, we need not fear it or, in general, any sand having a constant porosity, providing this porosity is within reasonable limits.

5. **Production of Oil and Water.** The past rate of production, both oil and water should be checked. If the plotted oil production shows a normal decline it will help prove that gas is the major expelling force. If water is produced with the oil, it should be found out, if possible, if it is due to casing leaks or bottom water, and if kept off the sand by the pumps. Salt water has been quite a problem to us because of corrosion and cutting troubles; however, we feel that if natural gas were used for restoring the pressure, corrosion and emulsion troubles would be very much less. On one of our repressured properties water has probably saturated the sand to the extent that it requires very high operating pressures and results have not been good up to the present time on this property.

6. **Resistance of Sand to the Admission of Gas.** Probably the only sure way this can be tested is to have a portable compressor made and try each prospective key well separately. If pressures above 350 pounds per square inch are going to be required, it should be carefully weighed before going to the expense of installing compressors. We have had very limited success on these high pressure properties; up to the present time part of this is due to the extra strain on the equipment and part due to poor results in increasing the recovery. Cut oil and corrosion give a lot of trouble here also.

7. The available supply of fresh water should be taken into consideration as a good supply of cooling water is very much desired for cooling engines and compressors.

Supply of Dry Gas

8. **Proximity to Supply of Dry Gas.** Unless due to bad co-operative conditions it is believed that it will pay to use gas for repressuring in most cases. There is no available data in our possession to prove this point, but it is reasonable to expect less corrosion and cutting of oil and less danger of explosions. The expense should not be prohibitive if it can be figured that nearly all the gas could be recovered when the property is to be abandoned. We do not know whether air or natural gas or the mixture of the two will give the best results, and this is of paramount importance. We feel that air will give the quickest results, but the ultimate yield is still in doubt. This item does not carry a great amount of weight in the selection of the property and perhaps is more of a desirable feature to have an ample supply of natural gas than an undesirable one, for if the property looked good otherwise we could afford to install oil-burning engines for driving the compressors and combat corrosion and emulsion rather than give it up as not fitted for repressuring.

9. **Effect of Vacuum.** If the property is sensitive to vacuum it will show quick response to pressure, and low pressures will be required. In general we look upon this as a favorable indication when considering repressuring.

10. **General Repair of the Properties.** If the property is in good repair at the time of repressuring this is another desirable feature; however, sometimes a property in poor repair shows that it has been neglected in the past with a corresponding higher saturation than one having the best of care during its life.

Selection of Key Wells

Generally, our first consideration of a location for a key well is its position with relation to other producing wells on the property. This, if conditions are very regular and there are no offsets to contend with, becomes a matter of selecting the well having the most number of relatively near but equidistant producing wells surrounding it. Of course, conditions are never alike at any well, so then it is probably best to prepare a list of the wells that are not desirable for key wells and make note of them on the map. Wells are put on this black list if they have the following undesirable features:

1. Broken and shaley sand. It is evident that wells having exposed sand of this nature will probably not take gas at a reasonable pressure.

2. Wells having an abnormally small amount of sand will be considered bad for the same reason as just previously stated, or because the volume of gas taken will be expected to be too small at reasonable pressures.

3. If a well has been producing a large amount of water, it is rejected if it is felt that the water has not been kept off the sand, so that the sand might be saturated in the vicinity of the well. If it is known that the well is producing edge water, it is thrown in the black list without question.

4. A relatively small daily production, unless due to some fault of the condition of the well, is considered undesirable. This is also taken as an indication of high resistance at this well and is classed as undesirable.

5. Relatively low initial productions are in this class for the same reason as (4), providing the wells were completed before the rock pressure was badly dissipated.

6. A well in poor repair, that is, one needing to be cleaned but cannot be because of collapsed pipe or junk in the hole, or one having a liner that cannot be pulled, is placed in this list. However, a well might have so much junk in it that it cannot be tubed low enough to pump and still make a good key well, because the sand has remained clean and would be productive if the fluid level was high enough. A well like this should by all means be taken for a key well.

7. If no authentic record can be found on a well, it is put in the doubtful class especially so if it is known that there is likely to be a barren sand exposed so that the pressure might be lost without doing any useful work.

8. All line wells that are offset are tabooed unless co-operation with the offset owner has been obtained. In the case an agreement has been made with the offset owner, sometimes this agreement fixes the wells to be made into pressure wells and the one to be maintained as producers.

9. Structural conditions at the well may have some bearing as to the direction of the spread of the pressure but we are not prepared to give data along this line as none of our properties has structural control. There seems to be evidence at some places that the spread is up structure, probably due to less resistance in this direction. If this is true, then the wells high on structure are not desirable for key wells. These general classes of undesirable features will help limit the wells to be considered to a lesser number so that it will be easier to make the selections. Now we can select the key wells from the wells considered as having the best chances of giving results and make them so distributed over the property that each well will have approximately the same area surrounding it. The real test, of course, is to try to force air into the well so selected. If a portable compressor is used, then actual data can be obtained as to the action of the well under pressure.

Notes on General Procedure

1. Preparing a Well for Pressure. As before stated, it is considered good practice to test each proposed key well with pressure before definitely deciding upon its choice. When necessary to run a string of tubing for testing a packer is set as near the top of the sand as possible and after the completion of the test this packer is removed and another permanent string of pipe run to carry the air to the sand. This permanent string is 4-inch pipe or any size large enough to make it possible to run a pumping string and is cemented near the top of the sand. If possible, it would be well to fill the space between the last two strings of pipe with mud as a protection against corrosive water breaking in between the water string and the pressure string. In some cases the sand has a very low resistance so that gas will be admitted at low pressures. In this case it is possible that gas may be turned into the casing as it stands, providing no sand is exposed having a lesser resistance than the oil-bearing sand. This is done in many cases which makes a very cheap and very adaptable installation. Perhaps where fairly long air strings are necessary, a small amount of the larger pipe might be cemented and by having a right and left threaded nipple may be unscrewed from and a string of 2-inch run on a packer to be set in the short string already cemented to the top of the sand. This would make possible the pumping of the well if it should in some way prove troublesome, as a key well.

If it is necessary to drill a well for pressure, it should have a water string set and the hole reduced near the top of the sand. After a moderate shot the pressure string is run cemented and filled to the top with mud. Wherever a well is drilled on a pressure property a core of the sand should be taken. Most operators prefer to shoot a well when drilled for pressure, the same as when completing producing well. Some operators also prefer to run a string of tubing inside the pressure string in key wells for the purpose of flowing any fluid out of the well that may have accumulated during a shutdown at the compressor station or for some reason the pressure is relieved at the well. This is probably a good idea where the wells make quite a volume of oil or water at the time repressuring is established.

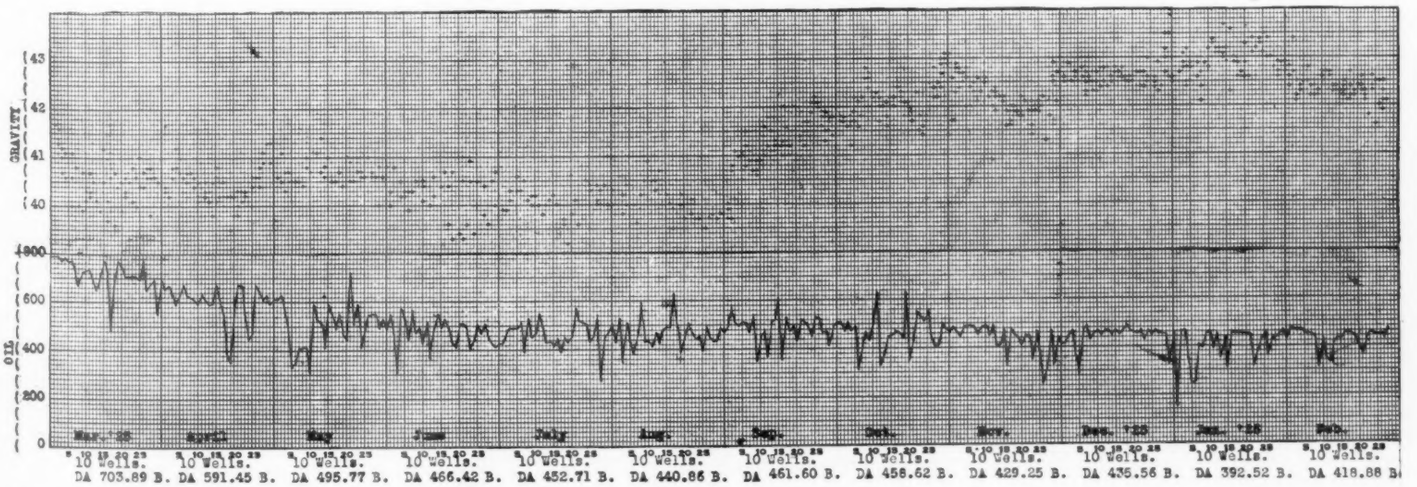
The Return Gas System. The gas emitted from the producing wells should be recycled if possible, as a means of conserving the natural gas. Most properties have a return system or vacuum system, however, it should be checked for capacity for the return volume will be increased to approximately one-half the amount forced into the sand and will probably increase to above this amount before operations are abandoned. Adequate drips are necessary for if the return system plugs at some point too high, a back pressure may be held on a group of wells, thereby causing unsteady production.

Pressure System

The Pressure System. The main things to be considered here are efficiency, capacity and strength. Drips are important in keeping the pressure steady at the plant and keeping a steady volume going into the wells. Sometimes it is necessary to make extra provisions to handle the gasoline condensed before and after the last stage of compression or this condensate will cause considerable trouble. This precaution will not be necessary where a gasoline plant is operated in conjunction with the compressor plant.

Compressor Equipment. A compressor plant large enough to handle the whole property should be built as near centrally located as possible. This location is generally influenced to a large extent by an adequate supply of water. The reason for a central location is increased pressure line capacity and decreased operating cost. The plant will give better operation if it is composed of say three units instead of one large one, the reason being better continuity of operation. The compressors and prime movers should be of the stationary type built for continuous service.

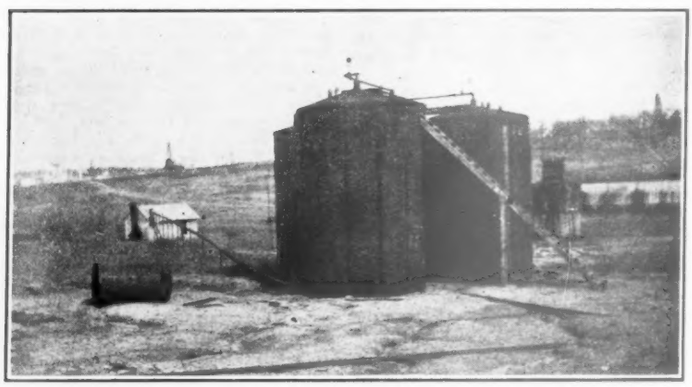
Labor Division. The Tidal Oil Co.'s plants are operated by one man who lives near the plant. In case the plant is centrally located and the property is not too large, the plant operator farm bosses the property. A man takes the



Graph showing the production and gravity of a Skelly Oil Co. lease in Creek County, Oklahoma. The left-hand side of the graph shows the gravity before the installation of the treating equipment, and the right-hand side the gravity after the equipment was installed.

gas volume readings on gas going into the key wells, and returning from the producers also, makes analysis of the return gas and tests the capacity of the compressors. This "tester" operates in a district and may have several properties to report on.

Data Taken on Operations. Tests on



The treating plant on the Skelly lease. The receiving tanks shown are insulated tanks, and the oil is introduced submerged instead of allowing it to splash into the tank.

Compressors.—Every week a capacity test is made on one unit in the station. This test is made on the discharge from the unit by a high pressure prover. This prover is made at our shops and is calibrated against a test prover.

Plant Operation Data. The discharge intermediate and hours each unit operates is given weekly.

Volume Tests at Key Wells. Each week a test is made on the volume of gas going into the key well. This test is accomplished by measuring the static and differential pressure across an orifice. Recording meters are not put on key wells because of the cost. It is thought that if the total gas is accurately measured on the return system at the intake to the compressors, that the amount compressed is closely enough known by having a fairly close check on the output of the compressors by prover tests. If a reasonably close check is kept on the hours each unit operates, this gives a reasonable figure on the amount of gas forced into the sand. The readings on the key wells give relative results which are considered accurate enough for its purpose.

Data Taken on Producing Wells

The producing wells are watched for increased production of both oil and gas also a field analysis of the air content of the gas is made. These tests are made at, approximately, each month. If the well shows an increasing amount of gas volume, the key wells effecting the producer are pinched in or some method is taken to hold back pressure on the produced. This phenomena of increasing gas volume on producing wells is called bypassing and is a factor of large importance in repressuring operations. If this bypassing becomes very bad, the producing well is taken off of production and entirely shut in or used for a key well.

In summarizing, it may be said that while repressuring does not always yield returns on the whole, it is paying its way without much trouble. There is much to learn about this method of increasing the yield of oil and a hearty co-operation among those who are specializing in its application will do much toward speeding up the knowledge of its complications.

The special problems to be considered at this time are:

1. The effects of gas as compared to air in repressuring operations.
2. The study of corrosion problems.
3. The study of the effect of the structure of the sand.
4. The effect of varying amounts of back pressure on producing wells and various other problems.

We have confidence that repressuring can be applied to many producing horizons.

PAUL SMITH ACHE, JR.

Paul S. Ache, president of the Reiter-Foster Oil Corp., is the proud father of an 8½-pound boy, born December 7, and named Paul Smith Ache, Jr. Mr. Ache in making the announcement of the birth said: "The boy has light curly hair, big brown eyes and, egotistically like all fathers. I believe he looks like me, which is extremely unfortunate for the baby. I sincerely believe in Santa Claus, as this is the greatest gift old Chris Kringle could have placed in my stocking."

NO IMPROVEMENT IN REFINING MARKET

(Continued from Page 20)

ing a decrease almost daily and the West Texas fields are not meeting the deficit just yet and many feel we are further away from a crude cut than any time during the last nine months.

Those who say the industry will witness a further crude cut, because of the trend toward lower refined oil prices can show where it is impossible for the average skimming and cracking plant to pay a fair return on the investment involved and only under exceptionally favorable conditions can such a plant break even on their operating costs.

Operating Loss

When a realization is figured using the present low refined oil prices and representative operating expenses a loss of 8.116 is shown per barrel of Seminole crude offered. The detail of this realization is shown below.

Revenue per barrel of Seminole crude refined in the Mid-Continent using average skimming and cracking yields and the low of today's refined oil prices:

Yields Pct.		Price per Bbl.	Revenue per Bbl.
55.0	Gasoline (U.S.M.)	.05⅝	$1.328
7.0	Kerosene (41 Gr.)	.04¼	.125
33.0	Fuel Oil (16 Gr.)	.70	.231
5.0	Loss		

Total revenue from refined oils per barrel of crude run $1.684

Seminole might be considered a fairly representative crude to use in this analysis because of the large amount being run and in fact, Seminole crude yields a higher revenue to the refiner than most other crude available in the Mid-Continent. The exceptions to this are the light green crudes suitable for the production of cylinder stocks and lubs but their volume is very small. The low prices were taken as the basis to show to what extent some refiners have gone to move their production. Furthermore, the loss of 11 cents a barrel does not include paying the sales cost, overhead nor any of the direct and indirect charges that collectively will force the total loss to 40 cents or 50 cents a barrel.

Likewise, conditions in the retail branch of the industry do not show an improvement although prices are fairly stable at their present low levels and an improvement in refinery prices can not be hoped for resulting from improvements in the retail prices. The weight of the general market was clearly shown when practically no attention was given the fact Pennsylvania crudes were advanced twice in three weeks.

Gasolines and Naphtha

Reports of U. S. Motor gasoline selling in differential territory and supplied out of Oklahoma at prices below the 5¾ cents shown as the present low further indicated the weakness of that market. There was a greater activity in the 400 endpoint grade and it showed the most stability. The 64-66, 375 grade also moved fairly well but it seems less popular than the 400 endpoint grade just at this time. This condition might be explained as the result of so much of the 390 and 400 endpoint gasoline still being supplied on previous export purchases. The 450 endpoint gasoline has had a very slow movement and only a few cars are moved from the entire number of Oklahoma plants daily. Naphtha has assumed a like position for it is about as cheap to use low gravity U. S. Motor gasoline as a blending stock for natural gasoline as to use naphtha.

Kerosene and Distillates

There was news of an export inquiry for kerosene late in the week which made refiners more hopeful of retaining the present price structure on kerosenes. It was apparent buyers were slow to order out any more than their day to day needs and this was not sufficient to take all of the production.

Natural Gasolines

Grade A generally sold at 5¼ cents and was scarce but the market was oversupplied with the other grades. The C grade went to a new low as it was offered at 3½ cents for resale. There was very little demand for it and what did move direct to refiners generally sold for 3¾ cents. Overproduction resulting from the cold weather and increased facilities, particularly in the Seminole Field, were again responsible.

The one outstanding factor favoring a quick turn in this trend is seen, however, in the report that a contract has been signed by the largest manufacturers in the Mid-Continent which will take more than its production over the first half of 1928. This company probably will enter the market shortly as a buyer in supplying the balance of the needs.

In addition, natural gasoline prices might be expected to materially strengthen within the next three months for it seems that Seminole has definitely reached its peak production and will cease to be the hazard it has been in the past. This decline which seems sure to come shortly will not be made up by production in the West Texas fields as will be the case with crude oil. Furthermore, as has been pointed out before, as more West Texas crude is refined there will be an increasing need for natural gasoline, for the West Texas gasoline needs approximately three times as much natural gasoline to bring it up to the same volatility as a normal blend of Seminole gasoline and natural gasoline. If the Seminole Field declines, as it seems likely to do, and West Texas is developed without finding a new field, there is likely to be quite a revision of prices as the result.

Gas Oil and Fuels

This market remained very quiet although there were no price changes. The low cold test fuel was the only material refiners were able to move and there were but few inquiries for it. Gas oil remained exceptionally quiet.

Lubricants and Wax

This market was also unchanged as sales managers attributed the falling off of sales to the seasonal decline. Compounded oils were about all that moved. There continued to be quite a volume of bright stock offered with price concessions and some was reported as having moved for export earlier in the week at 22 cents. This indicated the lack of confidence shown in this market but this price is the exception rather than the rule.

WILDCAT OPERATIONS IN WEST TEXAS

(Continued from Page 30)

William Schaffer et al's No. 2 University, 1,350 ft. N and 2,610 ft. E of SW cor. Sec. 9, Blk 47, University Land ..... Top salt 1,060 ft.; first oil show 2,190-96 ft.; second 2,225-29 ft.; 1 bailer oil in 10 hrs. at 2,590 ft.; shut down 2,635 ft., brown lime.

Simmons Oil Co. et al's No. 1 H. M. Halff, NW cor. Sec. 69, Blk. 1, I. & G. N. ..... Top salt 445 ft.; show oil 610 ft.; 500,000 ft. gas 854 ft.; cem. casing.

W. W. Donnelly & Young's No. 1 Massey, Sec. 29, Blk. U-V ..... Shut down 300 ft.

World Oil Co.'s No. 1 Schneeman-B, Sec. 50, Blk. BB, G. C. & S. F. Sur. ..... Top salt 1,070 ft.; hole full salt water 2,210-15 ft.; fish. 2,310 ft.

Young & Donnellys' No. 1 J. M. Shannon, C Sec. 11, Blk. 9, D. & S. E. Sur. ..... 6,000,000 ft. gas at 1,662 ft.; shut down 1,676 ft.

CULBERSON COUNTY

Deep Rock Oil Co.'s No. 2 Kloh-Rumsey, Sec. 21, Blk 29, T. & P. Sur., T-1 (NE of No. 1) ..... Drlg. 1,210 ft.

James H. Gardner et al's No. 1 Radford, C SE Sec. 29, Blk. 62, Public School Land Sur. ..... Shut down 700 ft.

Scott & Dittman's No. 1 Miller, SW cor. NW NE Sec. 1, School Blk, 97 ..... Drlg. 200 ft.

ECTOR COUNTY

The Texas Company and Cosden's No. 1 W. E. Connell, SE cor. Sec. 24, Blk. B-16, School Land ..... Top salt 925 ft.; small show oil 3,624 ft.; set. 8-in.

FISHER COUNTY

Cranfill & Reynold's No. 1 J. A. Young, Sec. 208, B. B. B. & C. Sur. ..... Drlg. 2,500 ft.; hole full salt water 2,400-35 ft.

Ideal Oil Co.'s No. 1 Jameson, C SE Sec. 111, Blk. 1, H. & T. C. Sur. ..... Hole full salt water 2,345-2,520 ft.; shut down 3,304 ft.

Marland Oil Co. and Texon's No. 1 McCall, Sec. 108, Blk. 3, H. & T. C. Sur. ..... Rig.

Marland Oil Co. and Vacuum Oil Co.'s No. 1 J. H. R. Lagow ..... Rig. up at 3,500 ft to deepen.

R. W. Raney's No. 2 Maberry, Sec. 56, Blk. 1, T. & P. Sur. ..... Shut down for orders 2,725 ft.

The Texas Company's No. 1 D. S. Stevens, C SW SE SE Sec. 79, Blk. 1, H. & T. C. Sur. ..... Hole full water 2,570-2,615 ft.; drlg. 2,750 ft.

FOARD COUNTY

Clark et al's No. 1 Atkins ..... Lime 1,580-1,930 ft.; show gas 1,885 ft.; drlg. 2,430 ft.

The Texas Company's No. 1 Watkins ..... Drlg. 3,575 ft.

GAINES COUNTY

Westheimer & Daube's No. 1 Birge & Forbes Land Co., Sec. 308, Terrell County School Land ..... Cem. 8-in. 3,900 ft.; shut down approx. 5,000 ft.

GARZA COUNTY

Emerald Oil Co.'s No. 1 D. Borén, NW cor. NE Sec. 137, Blk. 5, H. & G. N. Sur. ..... Small show oil in gray lime 1,884-1,902 ft.; shut down 2,600 ft.; show oil and hole full water 2,420-60 ft.

Gulf Prod. Co.'s No. 1 E. P. Swenson-A, Sec. 67, Blk.2, H. & G. N. Sur. ..... Top salt 495 ft.; top lime 2,075 ft.; drlg. 2,210 ft.

GLASSCOCK COUNTY

Texon & Marland's No. 1 Settles ..... Set 10-in. 1,420 ft.; drlg. 1,895 ft., red rock.

HOWARD COUNTY

California Co.'s No. 1 Fisher Bros., SE SW NW Sec. 36, Blk. 33, T. & P. Sur., T-1-S ..... Shows oil 1,530-48 ft. and 1,562-64 ft.; hole full water 2,020-34 ft.; hole full salt water 2,750-75 ft.; top lime 3,065 ft.; total depth 3,783 ft.; 6-in. froze.

Coyle-Concord Oil Co.'s No. 1 Dora Roberts ..... Drlg 1,870 ft.

Coyle-Concord Oil Co.'s No. 2 Dora Roberts ..... Cem. 6-in. 1,650 ft.; rig. machine.

Coyle-Concord Oil Co.'s No. 3 Dora Roberts, Sec. 156, Blk. 29 ..... Rig. up rotary.
Dixie Oil Co.'s No. 1 H. R. Clay ..... Drlg. 3,067 ft., gray lime.
Henshaw et al's No. 1 W. R. Settles, SW SE SW Sec. 135, Blk. 29 ..... Hole full sulphur water 1,325-30 ft.; shut down 1,900 ft.
Lockhart & Co.'s No. 1 Dora Roberts, Sec. 157, Blk. 29 .. Derrick.
Marland Oil Co.'s No. 1 Clay-E, NW NE SE Sec. 138, Blk. 29 ..... Pay 2,480-2,500 ft.; swabbed approx. 160 bbls.; hole full salt water 3,360-70 ft.; clean. out 3,552 ft.
Marland Oil Co.'s No. 1 Richardson, C NW Sec. 12, Blk. 32, T. & P. Sur., T-1-S ..... Top salt 870 ft.; drlg. 1,835 ft.
Marland Oil Co. and Zoch's No. 1 Jones, Sec. 32, Blk. 27, T. & P. Sur., elev. 2,218 ft. ..... Drlg. 2,320 ft.
Mays, Nixon & Flowers' No. 1 W. J. Flowers ..... Drlg. 1,090 ft.
Miley and Marland Oil Co.'s No. 1 C. D. Read, C NW Sec. 12, Blk. 31, T. & P. Sur. T-1-N ..... Spudded and shut down 5 ft.
Owens & Sloan's No. 2 Dora Roberts, SW cor. SE Sec. 136, Blk. 29 ..... Set 8-in. 1,923 ft.; bailing mud.
Peer Oil Corp's No. 1 Read, C NW Sec. 39, Blk. 30, T. & P. Sur., T-1-N. ..... Hole full salt water 2,790-2,820 ft.; total depth 3,215 ft.; underreaming 6-in.
Schermerhorn Oil Co.'s No. 1 Dora Roberts ..... Drlg. 1,800 ft.
Sun Oil Co.'s No. 1 W. R. Settles, Sec. 135, Blk. 29. ..... Rig. up cable tools.
Texon O. & L. Co. and Marland Oil Co.'s No. 1 Mrs. Connaly, NE cor. Sec. 15, Blk. 33, T. & P. Sur., T-1-N ..... Top salt 1,425 ft.; hole full salt water 1,760-1,800 ft.; show oil 3,065 ft.; hole full sulphur water 3,500-55 ft.; hole full water 3,925-50 ft.; underreaming 6-in. 4,050 ft.
Texon O. & L. Co. and Marland Oil Co.'s No. 2 W. R. Settles-A ..... Rig; drlg. water well.
Vitek Oil Co.'s No. 1 H. R. Clay ..... Total depth 1,786 ft.; shot with 120 qts. at 1,630-1,786 ft.; flow. 60 bbls. day.
Ward Oil Co.'s No. 1 Dora Roberts ..... Drlg. 1,600 ft.
Weekly Oil Corp. et al's No. 1 Dora Roberts, Sec. 156, Blk. 29 ..... Rig. cable tools.

HUDSPETH COUNTY

American Land Co.'s (was Lockhart Bros.') No. 1 Gardner & Moseley, C SE Sec. 5, School Blk. 21 ..... Drlg. 1,000 ft.
Western States Oil Co.'s (was Lockhart & Co.'s) No. 1 Moore, C SE Sec. 16, Blk. 71, T. & P. Sur., T-6 ..... Shut down for casing 900 ft.
Western States Oil Co.'s No. 1 Gardner & Mosley, Sec. 12, Blk. 18 ..... Spudding.

IRION COUNTY

F. E. Webb et al's No. 1 J. M. Nutt ..... Spudded and shut down.

JEFF DAVIS COUNTY

J. K. Hughes Dev. Co.'s No. 2 Means ..... Shut down 2,400 ft.; bailer hung.
Humble O. & R. Co.'s No. 2 Crecencio Flores, 1,130 ft. N and 850 ft. E of SW cor. Sec. 34, Blk. 58, T. & P. Sur., Twp. 8 ..... Drlg. 2,865 ft.; hole full water.

JONES COUNTY

Midwest Expl. Co.'s (was Campbell et al's) No. 1 L. H. Herndon, Sec. 6, M. E. P. & P. Sur., elev. 1,832 ft. ... Total depth 3,009 ft.; will shoot showings at 2,485-89 ft. and 2,558-61 ft.
Garland & Diamond's No. 1 E. D. Glynn, SE cor. Sec. 18, Deaf & Dumb Asylum Lands ..... Shut down 2,430 ft.
Hutson & Weaver's No. 1-A Smith ..... Total depth 1,980 ft. (cor.); shut down for casing.
W. G. Stough et al's No. 1 W. C. Bennett, Sec. 42, Orphan Asylum Sur. ..... Clean. out 800 ft.
W. G. Stough and others' No. 1 J. P. Willis, J. C. Patterson Sur. No. 2 ..... Shut down 1,740 ft.
Swensondale Oil Co.'s No. 1 Caton, SW NW Sec. 9, Deaf & Dumb Asylum Lands ..... Show oil 3,008-20 ft.; shot 80 qts., no results; shut down 3,200 ft.

KNOX COUNTY

Deep Rock Oil Co.'s No. 1 Moore ..... Shut down 900 ft.
Deep Rock Oil Co.'s No. 1 Big Four, 1,270 ft. S and 2,590 ft. W of NE cor. Sec. 31, Blk. 4 ..... Run. 6-in. 3,050 ft.

LOVING COUNTY

Lockhart Bros.' No. 1 fee, Sec. 85, Blk. 33, H. & T. C. Sur. ..... Rigging up.
Owens & Sloan's No. 1 W. D. Johnson, C SE Sec. 20, Blk. 53, T-2, T. & P. Sur., elev. 2,934 ft. ..... Shut down 1,020 ft.; in litigation.

LYNN COUNTY

Elpo Oil Co.'s No. 1 Nevols, NW cor. Sec. 6, Blk. C-42 School Lands ..... Shut down 630 ft.
Hart Oil Corp.'s No. 1 C. O. Edwards A-1 ..... Rig. up.

MENARD COUNTY

Carpenter & Robbins' No. 1 Kothman ..... 165 ft. 34.6 grav. oil at 414-15 ft.; shut in.
May & Clark's No. 1 Callan Ranch ..... Drlg. 220 ft.
Renfro et al's No. 1 J. Davis ..... Location.

MIDLAND COUNTY

Orbit Oil Co.'s No. 1 Moreland, C SE Sec. 17, Blk. 39, T. & P. Sur., T-1-S ..... Shut down 185 ft.
Shoup et al's No. 1 Roy Parks ..... Location.

MITCHELL COUNTY

Paul Teas et al's No. 1 A. C. Mills, NW cor. C. A. O'Keefe Sub. 11, J. P. Smith Sur. ..... Shut down for casing 260 ft.
Robert Thraves' No. 1 C. Way, Sec. 91, Blk. 27, T. & P. Sur., T-1-N ..... Total depth 2,508 ft.; shut down.

NOLAN COUNTY

Herbert Oil Co.'s (was McClesky and others') No. 1 Pepper, SE cor. SW Sec. 29, Blk. 22, T. & P. Sur. ... Rigged up and shut down.
Winemiller Corp.'s (was Reiter-Foster Oil Co.'s No. 1 T. E. Arledge, Sec. 217, Blk. 1, H. & T. C. Sur. ..... Fish. tools 1,900 ft.
Zweifel et al's No. 1 Longbotham, C SE Sec. 130, Blk. 1, H. & G. N. Sur. ..... Shut down 3,575 ft.

PECOS COUNTY

George Anderson's No. 1 Sherbine Bros. ..... Drlg. 325 ft.
Buell & Hagan's No. 1 Pryor & Wilson ..... New location.
Cummings et al's No. 1 Blackstone & Slaughter ..... Drlg. 2,270 ft.
Diamond Pet. Co.'s No. 1 Blackstone & Slaughter ..... Location.
M. C. Dibble & Hale's No. 1 Bone rake, Sec. 115, Blk. 8, H. & G. W. Sur., elev. 2,555 ft. ..... Shut down 640 ft.
Everett et al's No. 1 J. Fields ..... Spudded and shut down.
Gibson Oil Corp.'s No. 1 R. R. Russell ..... Drlg. 100 ft.
George A. Henshaw et al's No. 1 B. T. Corder, C SW Sec. 74, Blk. 2, C. C. S. D. Sur. ..... Drlg. 360 ft.
George A. Henshaw, Jr., No. 1 Schimmel, Sec. 29, Blk. 144, T. & St. L. Sur., elev. 2,780 ft. ..... Hole full sulphur water 1,275-80 ft.; drlg. 2,130 ft.
Kershaw & Livingston's No. 1 Cannon ..... Rig on ground.
Kirby Pet. Co. and Roxana's No. 1 W. W. Turney, NW cor. SW Sec. 11, Blk. 140, T. & St. L. Sur. ..... Hole full sulphur water 975-83 ft.; shut down 1,189 ft.
Mid-Kansas O. & G. Co.'s No. 1 Pryor & Wilson, NW cor. Sec. 3, Blk. 5, T. C. R. R. Sur. ..... Rigged up and shut down.
Moody Oil Corp.'s No. 1 B. T. Corder, C SW Sec. 77, Blk. 2, C. C. S. D. Sur. ..... Drlg. 700 ft.
Olean Pet. Co.'s No. 1 G. N. Harral, C SW Sec. 82, Blk. R-3, G. C. & S. F. Sur., elev. 3,005 ft. ..... 1,200 ft.; salt water 2,965-78 ft.; total depth 3,003 ft.; underreaming 8-in.
Quinby Oil Co.'s No. 1 Townsite, Sec. 1, Blk. 267, Client Addn. Sur. Fort Stockton, elev. 2,980 ft. ..... Shut down 3,440 ft.
Quinby Oil Co.'s No. 2 Bennet, C NW 592, Blk. 105, G. C. & S. F. Sur., elev. 2,560 ft. ..... Shut down 1,457 ft.
Quinby Oil Co.'s No. 1 A. A. Gary, 660 ft. N and 1,320 ft. E SW cor. Sec. 593, Abst. 3,009, elev. 2,551 ft. .... Shut down 700 ft.
Red Bank Oil Co.'s No. 1 Arthur Harral ..... Drlg. 1,620 ft.
Robert Lee's No. 1 Joe Parker ..... Rigging up.
B. J. Spikes' No. 1 George Brown ..... Spudded and shut down 140 ft.
Transcontinental Oil Co.'s No. 1 Blackstone & Slaughter, Sec. 29, Blk. 129, St. L. Sur., elev. 3,539 ft. ..... 250 ft. sulphur water in black sand 1,150-80 ft.; small show oil 1,510 ft.; show gas 1,540 ft.; show oil 2,080 ft.; brown sand 3,560-70 ft.; 250,000 ft. gas at 3,565 ft.; total depth 3,705 ft.; clean. out; hole caving.
World Oil Co.'s No. 1 Kloh, Sec. 47, Blk. 48, Twp. 8, T. P. R. R. Sur., elev. 2,810 ft. ..... Rigging up.
World Oil Co.'s No. 1 Serf, SW cor. NE Sec. 10, Blk. 130, T. & St. L. elev. 3,245 ft. ..... Spud. 95 ft.

Yates Pool, Pecos County

(*denotes test in extension territory.)

*Allsman & Bell's No. 5 River Red, 312 ft. N of No. 4 .... Drlg. 300 ft.
Allsman & Bell's No. 8 River Bed ..... Rig. up.
*Allsman & Bell's No. 11 River Bed ..... Drlg. 860 ft.
California Co.'s No. 2 Yates, Sec. 34, Blk. 194 ..... Rig standing.
California Co.'s No. 9 Yates, Sec. 34, Blk. 194 ..... Building rig.
California Co.'s No. 10 Yates, Sec. 34 ..... Building rig.
California Co.'s No. 1 Smith, Lease 1 ..... Moving in tools.
California Co.'s No. 4 Smith, Sec. 35, Blk. 194 ..... Drlg. 1,580 ft.; show oil 1,547 ft.
California Co.'s No. 6 Smith, Sec. 35 ..... Cem. 8-in. 1,453 ft.; show oil 1,448-50 ft.
California's No. 6 Smith, Sec. 35 ..... Run. 10-in. 782 ft.
California Co.'s No. 7 Smith, Sec. 35 ..... Drlg. 875 ft.
California Co.'s No. 8 Smith ..... Drlg. 385 ft.
California Co.'s No. 9 Smith ..... Waiting on tools; No. 10 location.
*Day Bros. & McKnight's No. 1 Yates, NW cor. Sec. 58, Blk 1 ..... Top salt 440 ft.; shut down for casing 895 ft.
Douglas Oil Co.'s No. 2 J. T. Sellman ..... Rig. up.
Gulf Prod. Co.'s No. 3 Smith-A, Sec. 28, Blk. 194 ..... Cem. 6-in. 1,410 ft., brown lime.
Gulf Prod. Co.'s No. 4 Smith-A ..... Drlg. 1,000 ft., anhydrite.
Gulf Prod. Co.'s No. 5 Smith-A ..... Drlg. 475 ft.
Gulf Prod. Co.'s No. 6 Smith-A ..... Rig. up.
Gulf Prod. Co.'s No. 7 Smith-A ..... Building rig.
*Gulf Prod. Co.'s No. 4 Yates, Runnels Co. School Land.. Total depth 500 ft.; underreaming 10-in.
Gulf Prod. Co.'s No. 5 Yates ..... Drlg. 600 ft.
Gulf Prod. Co.'s No. 6 Yates ..... Drlg. 165 ft.
Gulf Prod. Co.'s No. 7 Yates ..... Drlg. 175 ft.
Humble O. & R. Co.'s No. 4 Smith-A ..... Top pay 1,470 ft.; flowed 12 bbls. hrly. at 1,630 ft.; flowed 250 bbls. hr. 1,650 ft.
Humble O. & R. Co.'s No. 5 Smith-A ..... Drlg. 1,270 ft.
Humble Oil Co.'s No. 3 M. A. Smith-B, Sec. 101, Blk. 194 ..... Drlg. 600 ft.
Humble O. & R. Co.'s No. 1 Tippett ..... Cellar; shut down.
McMan O. & G. Co.'s No. 1 J. H. Tippett, Sec. 108, Blk. 194 ..... Hole full water 240-60 ft.; drlg. 360 ft.
*Mazda and Savoy's No. 2 Smith, Sec. 24, Blk. 194 ..... Location.
McMan and Marland's No. 12 Yates, Sec. 34½, Blk. 194.. Shut down 1,344 ft.; flow. 80 bbls. hr.
McMan & Marland's No. 13 Yates ..... Top lime 1,271 ft.; set 6-in. 1,276 ft.
McMan & Marland's No. 14 Yates ..... Stand. cem. 1,281 ft.
McMan and Marland's No. 15 Yates ..... Spud. 100 ft.
McMan and Marland's No. 16 Yates ..... Location.
Marland Oil Co.'s No. 9 Yates-A, Sec. 60, Blk. 1 ..... Shut down 1,030 ft.; made 800 bbls. in 6 hrs.
Marland Oil Co.'s No. 10 Yates-A ..... Flowed 300 bbls. hr. 999-1,038 ft.
Mid-Kansas and Transcontinental's No. 8 Yates-A, Sec. 33½, Blk. 194 ..... Shut down 1,112 ft.; flowed 3,996 bbls. in 15 hrs. through 1 2-in. and 1 3-in. lines.
Mid-Kansas and Transcontinental's No. 10 Yates-A, Sec. 33½, Blk. 194 (N of No. 1) ..... Fishing 85 ft.
*Mid-Kansas and Transcontinental's No. 11 Yates-A, Sec. 33½, Blk. 194 (S of No. 1) ..... Drlg. 320 ft.
Mid-Kansas and Transcontinental's No. 12 Yates-A ..... Rig. up.
Mid-Kansas and Transcontinental's No. 13 Yates-A ..... Rig. up; wait. on machine.
Mid-Kansas and Transcontinental's No. 14 Yates-A ..... Rig. up; wait. on machine.
Mid-Kansas and Transcontinental's No. 15 Yates-A ..... Wait. on machine.
Mid-Kansas and Transcontinental's No. 10 Yates-B, Sec. 61, Blk. 1 ..... Location.
Mid-Kansas and Transcontinental's No. 11 Yates-B ..... Cellar.
*Mid-Kansas and Transcontinental's No. 12 Yates-B ..... clear.
Mid-Kansas and Transcontinental's No. 13 Yates-B ..... Drlg. 1,025 ft.
Mid-Kansas and Transcontinental's No. 14 Yates-B ..... Drlg. 1,077 ft.
Mid-Kansas and Transcontinental's No. 17 Yates-B ..... Drlg. 420 ft.
Mid-Kansas and Transcontinental's No. 18 Yates-B ..... Drlg. 500 ft.
Mid-Kansas and Transcontinental's No. 19 Yates-B ..... Location; wait. on machine.
Mid-Kansas and Transcontinental's No. 20 Yates-B ..... Run. 10-in. 420 ft.
Mid-Kansas and Transcontinental's No. 21 Yates-B ..... Drlg. 70 ft.
Mid-Kansas and Transcontinental's No. 22 Yates-B ..... Cellar.
Mid-Kansas and Transcontinental's No. 23 Yates-B .... Rig. up.
Mid-Kansas and Transcontinental's No. 4 Yates-C, Sec. 60, Blk. 1 ..... Show oil 660-65 ft.; ream. 965 ft.
Mid-Kansas and Transcontinental's No. 6 Yates-C ..... Wait. on machine.
Mid-Kansas and Transcontinental's No. 9 Yates-C ..... Cem. 841 ft.
Mid-Kansas and Transcontinental's No. 10 Yates-C ..... Location.
Mid-Kansas and Transcontinental's No. 2 M. A. Smith ... Drlg. 330 ft.
Mid-Kansas and Transcontinental's No. 2 Yates-D, SW part Sec. 62, Blk 1 ..... Drlg. 460 ft.
Mid-Kansas and Transcontinental's No. 7 Smith-Taylor.. Build. road.
Mid-Kansas and Transcontinental's No. 8 Smith-Taylor.. Wait. on machine.
Mid-Kansas and Transcontinental's No. 9 Smith-Taylor.. Wait. on machine.
Oregon Oil Corp.'s No. 1 Yates ..... Build. road.
Roxana Pet. Corp.'s No. 4 Tippett ..... Stand. cem. 1,211 ft.
Roxana Pet. Corp.'s No. 5 J. H. Tippett, Sec. 102, Blk. 194 ..... Drlg. 760 ft.
Roxana Pet. Corp.'s No. 6 J. H. Tippett, Sec. 102, Blk. 194 ..... Spud. 25 ft.
Roxana Pet. Corp.'s No. 7 J. H. Tippett ..... Drlg. 100 ft.
Roxana Pet. Corp.'s No. 3 Smith, SE cor. SW Sec. 27, Blk 194 ..... Drlg. 300 ft.
Roxana Pet. Corp.'s No. 4 Smith ..... Drlg. 750 ft.
Roxana Pet. Corp.'s No. 5 M. A. Smith, Sec. 27, Blk. 194.. Rig. up.
Simms Oil Co.'s No. 4 Smith, Sec. 103, Blk. 194 ..... Drlg. 360 ft.
Simms Oil Co.'s No. 5 Smith ..... Rig. up.
Simms Oil Co.'s No. 6 Smith ..... Rig. up machine.

PRESIDIO COUNTY

Headlock & Miller's No. 1 Tootle Est., Sec. 123, Blk. 3, D. & P. Sur., elev. 2,912 ft. ..... Salt water 2,610 ft.; total depth 3,003 ft.; shut down for orders.
Pinto Canyon Oil Co.'s No. 1 Fields, 1,760 ft. S and E NW cor. Sec. 74, Blk 2, D. & P. Sur. ..... Location.

REAGAN COUNTY

Henshaw & Camp's No. 1 University, Sec. 14, Blk. 49, University Land, elev. 2,772 ft. ..... 250 ft. sulphur water at 800 ft.; drlg. 2,100 ft.
Skelly Oil Co.'s No. 1 University, SW cor. Sec. 33, Blk. 8, University Land ..... Top salt 1,340 ft.; fishing 2,795 ft.
Texon O. & L. Co.'s No. 1-B University, Group 1 ..... Top pay 6,284 ft.; total depth 6,590 ft.; 3,800 ft. of 38.7 grav. oil in hole; clean. out 6,540 ft.
White et al's No. 1 Shofner & Sterling, SE cor. NW Sec. 10, 2 m. N of Big Lake ..... Shut down 905 ft.

REEVES COUNTY

Exploration Co.'s No. 1 A. A. Kinney, 1,500 ft. W of NE cor. Sec. 26, Blk. C-18, Public School Land, elev. 2,847 ft. ..... Show oil 1,105-10 ft.; total depth 1,275 ft.; cleaning out.
Grisham-Hunter Corp.'s No. 1 Rathge & Connor ..... Rig.
David R. Thompson's No. 1 A. A. Eddins ..... Fish. bit 4,170 ft.
World Oil Co.'s No. 1 Biggs, C SE Sec. 65, Blk. 112, Public School Land Sur., elev. 3,068 ft. ..... Shut down 1,610 ft.
World Oil Co.'s No. 1 Duff, elev. 2,753 ft. ..... Hop Delaware lime 4,185 ft.; hole full brackish salt water 4,368-4,500 ft.; plug. back to 4,250 ft. to shoot 70 qts. at 4,185-4,223 ft.

RUNNELS COUNTY

Empire G. & F. Co.'s No. 1 C. C. Clay ..... Drlg. 2,050 ft.
Gibson & Johnson's No. 1 Harris Est., Juliana Voske Cabrera Sur. ..... Location.
Gibson & Johnson's No. 1 H. P. Serratt, C SE NW Sec. 150, E. T. R. R. Sur. ..... Rig. up.
Kennedy et al's No. 1 J. E. Tally ..... Shut down 1,720 ft.
May et al's No. 1 J. M. Schneider, John Wall Sur. ..... One-half bailer salt water 1,032 ft.; fish. casing 1,056 ft.
Miles Oil Co.'s No. 1 Charles Ray, Sec. 21, T. & N. O. Sur. ..... Cellar.
Miles Oil Co.'s No. 1 L. S. Lawhon, NE cor. Sec. 68 ..... Show gas 960-80 ft.; shut down 2,250 ft.

Noble O. & G. Co.'s No. 1 Sims, Sec. 12, J. J. McHenry Sur. ..... Hole full sulphur water 2,710-20 ft. and hole full salt water 2,820 ft.; drlg. 3,160 ft.
Royal Pet. Co.'s No. 1 A. C. Willingham ..... Rig; moving in tools.
Swensondale Oil Co.'s No. 1 E. A. Werner ..... Shut down for 8-in. 1,850 ft.
Owenwood Oil Corp.'s No. 1 H. B. Fowler ..... Location.
Watchorn O. & G. Co.'s No. 1 J. L. King ..... Drlg. 1,615 ft.

SCHLEICHER COUNTY

Beavers & Leath et al's No. 1 J. A. and W. T. Whitten, C NW Sec. 35, Blk. 11, T. O. Sur. ..... Shut down 400 ft.
Thomas Grey et al's No. 1 Ball Robinson, C NW Sec. 25, Blk. M. G. H. & S. A. Sur. ..... Sulphur water 2,125 ft.; hole full water 2,160-80 ft. and 2,935 ft.; total depth 3,090 ft.; underreaming 6-in.

SCURRY COUNTY

J. B. Mims et al's No. 1 J. J. Koonsman, Sec. 220, Blk. 2, H. & T. C. Sur. ..... Rig.

STERLING COUNTY

Orr et al's No. 1 Neal Reed, CNL Sec. 15, Blk. 30, W. & N. W. Sur. ..... Shut down 1,390 ft. (cor.).

STONEWALL COUNTY

Peer Oil Corp. and Producers Oil Co.'s (was J. P. Johnson's) No. 1 R. P. Morrow ..... Hole full water 2,625-90 ft.; set 10-in. 2,700 ft.; preparing to plug at 3,038 ft.

TAYLOR COUNTY

A. J. Brown et al's No. 1 Henslee, NE cor. Sec. 5, Blk. 4, S. P. R. R. Sur. ..... Drlg. 2,300 ft.
Dorning & Perrine's No. 1 J. A. Hammer, C N 100 acres, Sec. 23, Blk. 19, T. & P. Sur., elev. 1,904 ft. .... Shut down 455 ft.
Gilbert Johnson and Day Bros.' No. 1 C. M. Brown, Sec. 1, Blk. 6, T. & P. Sur. ..... Shut down 835 ft.
Owen & Sloan's No. 1 Lattimer, Sec. 14, Blk. 9, T. & P. Sur. ..... Fish. 2,605 ft.
Roeser & Pendleton's No. 1 Sam Hutman, C W half NW Sec. 64, Blk. 5, T. & P. Sur. ..... Water sand 2,222 ft.; total depth 2,945 ft.; underreaming 5-in.

TERRELL COUNTY

Deep Rock Oil Co.'s No. 1 H. C. Nolke, Sec. 4, Blk. A-2, T. C. R. R. Sur. ..... Cellar.
Humble Oil Co.'s No. 1 University, Sec. 15, Blk. 34 ..... Spudding.
Milham Exploration Co.'s No. 1 Bassett, CNL Sec. 99, Blk. Y, W. H. Robertson Sur. ..... Drlg. 975 ft.

TERRY COUNTY

Kingsland O. & G. Co.'s No. 1 Brownsfield, C NW SW SW Sec. 7, Blk. 1-A, E. L. R. R. Sur. ..... Slight show gas 2,230 ft.; run 6-in. 3,207 ft.

TOM GREEN COUNTY

George Amery's No. 1 Wilkey, C SW Sec. 3, B. A. L. Sur. ..... Location.
Cox et al's No. 1 Llano ..... Total depth 470 ft.; shut down.
Fitzgerald et al's No. 1 Bennett ..... Drlg. 1,715 ft.
Marland Oil Co.'s No. 1 J. W. Johnson, C SE, Sec. 6, R. B. Sanderson Sur. ..... Hole full water 2,020-45 ft.; fished out line 2,830 ft.
Marland Oil Co.'s No. 1 J. W. Johnson-A ..... Fished out tools 2,150 ft.
Pulsa Oil Co.'s No. 1 Adams, C SW Sec. 163, Blk. 11, S. P. R. R. Sur. ..... Shut down lime 1,020 ft.
Haulbert et al's No. 1 Johnson ..... Shut down 665 ft.

UPTON COUNTY

Mark Curtis et al's (was Hultz et al's) No. 2 Giddings, 5,336 ft. S and 6,678 ft. E of NW cor. Throckmorton Co. School Land, League 1, elev. 2,757 ft. ..... Shut down 630 ft.
Skelly Oil Co.'s No. 1 J. F. Lane, SW cor. SE SE Sec. 3, G. C. & S. F. Sur. ..... Swabbed 65 bbls. 2,045-80 ft.
Southern C. O. P. Co.'s No. 1 C. W. Hobbs ..... Flowed sulphur water 2,340-80 ft.; drlg. 2,510 ft.
The Texas Company and Cordova Union's No. 1 Union Land, Sec. 23, Blk. 35, H. & T. C. ..... Top pay 2,098 ft.; swabbed 60 bbls. in 36 hrs. at 2,271 ft., 2 per cent water; shut down 2,318 ft.; will deepen.
Texas Pacific C. & O. Co.'s No. 11 J. F. Lane-A lease, Sec. 5 ..... Drlg. 1,930 ft.
Tulsa Drlg. Co.'s No. 1 W. A. Chaney, Sec. 18, Blk. 3, M. K. T. Sur. ..... Top salt 670 ft.; show oil 2,090 ft.; total depth 2,435 ft.; plugging back to oil show.
Wise & Jackson's No. 1 J. H. Porter, SW cor. SW SW Sec. 184, Blk. E, elev. 2,592 ft. ..... Top pay 3,419 ft.; total depth 3,517 ft., gray lime; shut down.

VAL VERDE COUNTY

A. Blume et al's No. 1 Moore Est., Sec. 183, J. Mitchell Sur., elev. 953 ft. ..... Shut down 3,000 ft.
Curso Williams' No. 1 Holman, NE NE Sec. 5, Blk. N, G. H. & S. A. Sur. ..... Shut down 2,940 ft.
East Del Rio Oil Co.'s No. 1 Russell, SE cor. Sec. 183, Del Rio Town Sur., elev. 941 ft. ..... Total depth 3,190 ft.; shut down.
Magnolia Pet. Co.'s No. 1 Whitehead, Sec. 81, D. G. C. & S. F. Sur., elev. 1,770 ft. ..... Drlg. 5,450 ft.
Independent Operators' No. 1 Whitehead, SE SE Sec. 30, Blk. 4, I. & G. N. Sur., elev. 1,175 ft. ..... Shut down 3,900 ft.
O. O. Owens' No. 1 Mills, Sec. 128, Blk. 1, I. & G. N. Sur. elev. 2,130 ft. ..... Gas sand 2,491-2,520 ft.; tested 125,750 ft.; gas; reset 8-in. 2,511 ft.; drlg. 3,820 ft.
W. B. Thraves et al's No. 1 W. E. Wilson ..... Spudding.

WARD COUNTY

Selby Oil Co. et al's No. 1 A. G. Dooley et al ..... Rig up cable tools.

WINKLER COUNTY

Amerada Pet. Corp.'s No. 1 J. B. Walton, SW cor. NW Sec. 48, Blk. 26, elev. 2,833 ft. ..... Top salt 1,086 ft.; 2,500,000 ft. gas 1,700-08 ft.; killed gas with 3½ tons baroid; cored brown lime carrying oil 2,334 ft.; show gas 2,400 ft.; blew tools up in hole; fished out and drilled to 2,411 ft. where another pocket of gas again caused fish. job; fish. tools 350 ft. from top.
Atlantic O. P. Co.'s No. 1 Ida Hendrick, SE cor. W half NE Sec. 44, Blk. 26 ..... Show gas 2,770 ft.; top pay 2,830 ft.; fishing bit 2,936 ft.; aver. 220 bbls. past week.
Atlantic O. P. Co.'s No. 2 Grisham-Hunter ..... Drlg. 2,710 ft.
Atlantic O. P. Co.'s No. 3 Grisham-Hunter ..... Drlg. 770 ft.
Atlantic O. P. Co.'s No. 4 Grisham-Hunter ..... Building rig.
Atlantic O. P. Co.'s No. 1 Grisham-Hunter-C (was Lemar) ..... Drlg. 2,485 ft.
Atlantic O. P. Co.'s No. 1 Ida Hendrick-D ..... Top pay 2,870 ft.; drlg. 2,915 ft.; flow. by heads.
Atlantic O. P. Co.'s No. 2 Ida Hendrick-D ..... Total depth 2,554 ft.; cem. 8-in.
Atlantic O. P. Co.'s No. 1 Grisham-Hunter-E ..... Total depth 2,274 ft.; cem. 8-in. standing.
Atlantic O. P. and Collett's No. 1 Ida Hendrick-F ..... Spud. 55 ft.
V. T. Bolin et al's No. 1 Brown ..... Spudded and shut down.
Magnolia Pet. Co.'s (was G. M. Church et al's) No. 1 Ida Hendrick, Sec. 29, Blk. B-5 ..... Top first pay 2,713 ft.; aver. 2,650 bbls. past week 2,830-2,917 ft.
Magnolia Pet. Co.'s (was G. M. Church et al's) No. 2 Ida Hendrick ..... Show oil 2,750 ft.; top pay 2,865 ft.; shut down 2,955 ft.; flowed 1,320 bbls. fluid, 200 bbls. salt water.
Magnolia Pet. Co.'s No. 3 Ida Hendrick ..... Cem. 8-in. 2,425 ft.; drlg. plug.
Cranfill Bros. and California Co.'s No. 1 M. J. Bashara, at cor. Secs. 10, 11, 22 and 23, School Blk. 77 ..... Total depth 3,503 ft. (s.l.m.); shut down for orders.
Cranfill & Reynold's No. 1 Grisham-Hunter-B, Sec. 35, Blk. B-5 ..... Drlg. 2,460 ft.
Cranfill & Reynolds' No. 1 Hendrick-C ..... Drlg. 620 ft.
Eastland Oil Co. and Arnold's No. 1, Sec. 35, Blk. B-5 .. First gas 2,492 ft.; 7,000,000 ft. at 2,512 ft.; drlg. 2,600 ft.
Gulf Prod. Co.'s No. 8 T. G. Hendrick, Sec. 34 ..... Rig. up.
Gulf Prod. Co.'s No. 9 T. G. Hendrick ..... Build. rig.
Humble O. & R. Co.'s No. 1 T. G. Hendrick, NW cor. NE Sec. 34, Blk. B-5, Public School Land, elev. 2,816 ft. ..... Total depth 2,763 ft.; fished out one bit; gas which had been killed broke loose again; trying to drill by tools 2,743 ft.
Humble O. & R. Co.'s No. 3 Hendrick, Sec. 34, Blk. B-5 .. 5,000,000 ft. gas from 2,195 ft.; drlg. 2,625 ft.
Humble O. & R. Co.'s No. 5 Grisham-Hunter ..... Cem. 12-in. 306 ft.
Humble O. & R. Co.'s No. 2 Ida Hendrick-B ..... Rig on ground.
Humble O. & R. Co.'s No. 3 Ida Hendrick-B ..... Show oil 2,990 ft.; top pay 3,016 ft.; flowing 270 bbls. hr. 3,027 ft.
Independent O. & G. Co.'s No. 3 Grisham-Hunter, Sec. 34 .. Location.
Independent O. & G. Co.'s No. 4 Grisham-Hunter ..... Location.
Independent O. & G. Co.'s No. 5 Grisham-Hunter ..... Rig. up.
Independent O. & G. Co.'s No. 6 Grisham-Hunter ..... Rig. up.
Independent O. & G. Co.'s No. 7 Grisham-Hunter ..... Rig. up.
Independent O. & G. Co.'s No. 8 Grisham-Hunter ..... Rotary derrick.
Independent O. & G. Co.'s No. 2 Hendricks-A, elev. 2,822 ft. ..... Top pay and total depth 2,815 ft.; aver. 734 bbls. past week; will prob. fish out tools and deepen.
Independent O. & G. Co.'s No. 1 Vardeman-B ..... Top salt 1,775 ft.; drlg. 1,870 ft.
Independent O. & G. Co.'s No. 2 Vardeman-B ..... Rig. up rotary.
Independent O. & G. Co.'s No. 3 Vardeman-B ..... Cellar.
Liner Drlg. Co.'s No. 1 Seth-Campbell, NE cor. Sec. 2, Blk. B-5 ..... Shut down 450 ft.
Landreth Prod. Corp.'s No. 1 Hendrick-A, SE cor. SW Sec. 29, Blk. B-5 ..... Total depth 3,013 ft.; aver. 16 bbls. daily past week; clean. out to deepen.
Landreth and Roxana's No. 2 Ida Hendrick-A, Sec. 29, Blk. B-5 ..... Partly rigged and shut down.
Landreth and Roxana's No. 3 Ida Hendrick-A, Sec. 29, Blk. B-5 ..... Spud. 50 ft.
Landreth and Roxana's No. 4 Ida Hendrick-A ..... 1,000,000 ft. gas 2,790-93 ft.; top pay 2,930 ft.; drlg. 2,965 ft.
Magnolia Pet. Co.'s No. 4 Ida Hendrick ..... Drlg. 2,495 ft.
Magnolia Pet. Co.'s No. 5 Ida Hendrick ..... Cem. 12-in. 220 ft.
Murchison Oil Co. et al's (was Marland Oil Co.'s) No. 1 Grisham-Hunter-B ..... Location.
Murchison Oil Co. et al's (was Marland Oil Co.'s) No. 2 Grisham-Hunter-B (formerly No. 3-B) ..... Aver. 320 bbls. 2,890-3,050 ft.; clean out to shoot.
Murchison Oil Co. et al's (was Marland Oil Co.'s) No. 3 Grisham-Hunter-B (formerly No. 2-B) ..... Show. oil 2,630 ft.; total depth 2,427 ft.; tore down standard rig.; stand. cem.
Murchison Oil Co. et al's (was Marland Oil Co.'s) No. 4 Grisham-Hunter-B ..... Drlg. 2,846 ft.
Mining & Engineering Co.'s No. 1 T. G. Hendrick, Sec. 10, Blk. B-12 ..... Partly rigged and shut down.
Murchison Oil Co. and Cranfill Bros.' No. 2 Grisham-Hunter ..... Location.
Murchison Oil Co. and Cranfill Bros.' No. 4 Grisham-Hunter ..... Location.
The Texas Company's (was Pure Oil Co.'s) No. 2 Hendrick, elev. 2,827 ft. ..... Top salt 1,518 ft.; top lime 2,390 ft.; spraying oil with 15,000,000 ft. gas 2,657-2,825 ft.; rig rebuilt; rigging up.
The Texas Company's (was Pure Oil Co.'s) No. 3 Hendrick, NE cor. SW Sec. 41, Blk. B-5 ..... Standardizing 2,360 ft.
The Texas Company's (was Pure Oil Co.'s) No. 1 Hendrick-B, NE cor. SE Sec. 34, Blk. B-5 ..... Show gas 2,350-60 ft.; show oil 2,380 ft.; 15,000,000 ft. gas at 2,490 ft.; more gas 2,564 ft.; 40,000,000 ft. gas at 2,720 ft.; trying to kill gas.
The Texas Company's (was Pure Oil Co.'s) No. 2 Hendrick-B ..... Top lime 2,387 ft.; top pay 2,808 ft.; drlg. 2,808 ft.; flow. small heads.
The Texas Company's (was Pure Oil Co.'s) No. 3 Hendrick-B ..... Cem. 8-in. 2,438 ft.; 4,000,000 ft. gas 2,600 ft.; drlg. 2,680 ft.
The Texas Company's (was Pure Oil Co.'s) No. 4 Hendrick-B ..... Build. rig.
The Texas Company's No. 1 Grisham-Hunter-C ..... New location.
Republic Prod. Co.'s No. 1 Grisham-Hunter-A, NW cor. E half SW Sec. 45, School Block 26 ..... Top lime 2,440 ft.; 15,000,000 ft. gas at 2,775 ft.; top pay 2,800 ft.; flow. 165 bbls.; top big pay 2,865-67 ft.; flowed 6,010 bbls. Dec. 12, 4,140 bbls. Dec. 14; will deepen.
Republic Prod. Co.'s No. 1-A Grisham-Hunter-B, SW cor. E half SE Sec. 41, Blk. B-5 ..... Drlg. plug 2,008 ft.
Republic Prod. Co.'s No. 2 Grisham-Hunter-B ..... Drlg. 2,437 ft.
Roxana Pet. Corp.'s No. 1 Grisham-Hunter-A, SW cor. E half NW Sec. 45, School Blk. 26 ..... Top lime 2,428 ft.; little gas; show oil and gas 2,570 ft.; increase gas at 2,597 ft.; spraying oil 2,760-65 ft.; 65,000,000 ft. gas 2,800-01 ft.; blew tools up in hole; gas broke gauge at 58,500,000 ft.; started spraying little oil Nov. 21; flew up separator Dec. 14; sprayed 300 bbls.
Roxana Pet. Corp.'s No. 1 Grisham-Hunter-B, SW cor. S half SE Sec. 29, Blk. B-5 ..... Top lime 2,657 ft.; show oil and gas 2,630 ft.; fishing bailer 3,010 ft.
Roxana Pet. Corp.'s No. 2 Grisham-Hunter-B ..... Rig. up rotary.
Roxana Pet. Corp.'s No. 2 Grisham-Hunter-C, SE cor. N half NW Sec. 29, Blk. B-5 ..... Top salt 1,405 ft.; drlg. 2,025 ft.
Roxana Pet. Corp.'s No. 3 Grisham-Hunter-C ..... Drlg. 230 ft.
Roxana Pet. Corp.'s No. 4 Grisham-Hunter-C ..... Rig. up rotary.
Roxana Pet. Corp.'s No. 5 Grisham-Hunter-C ..... Rig. up rotary.
Roxana Pet. Corp.'s No. 1 Grisham-Hunter-D, SW cor. S half NE Sec. 41, Blk. B-5 ..... Drlg. 2,555 ft.; show oil and gas 2,504 ft.
Roxana Pet. Corp.s No. 2 Grisham-Hunter-D ..... Location.
Sheldon & Burden's No. 1 Ida Hendrick, SW cor. SE Sec. 28, Blk. B-5 (10-a. tract) ..... Top salt 1,260 ft.; cem. 6-in. at 2,610 ft. in lime (s.l.m.); total depth 2,613 ft.
Southern C. O. P. Co.'s No. 2 Ida Hendrick T-88-B .... Total depth 2,659 ft.; cem. 6-in. in lime; stand. cem.
Southern C. O. P. Co.'s No. 2 T-89 Grisham-Hunter-A, Sec. 35, Blk. B-5 ..... Standardizing 2,301 ft.
Southern C. O. P. Co.'s No. 3 T-89-A Grisham-Hunter-A.. First gas 2,400 ft.; 3,000,000 ft. gas 2,415-20 ft.; fish. for tools.
Southern C. O. P. Co.'s No. 4 T-89-A Grisham-Hunter-A.. Rig. up rotary.
Texon O. & L. Co.'s No. 1 Grisham-Hunter-A, SW cor. SE Sec. 41, Blk. B-5 ..... Drlg. 2,900 ft.; flowed aver. 2,023 bbls. past week; increase at 2,829 ft.
Texon O. & L. Co.'s No. 2 Grisham-Hunter-A ..... 5,000,000 ft. gas 2,260-2,500 ft.; 15,000,000 ft. gas 2,646-56 ft.; total depth 2,725 ft.; killing gas to fish tools; 40,000,000 ft. gas.
Texon O. & L. Co.'s No. 3 Grisham-Hunter-A, NW cor. W half SE Sec. 41, Blk. B-5 ..... Cem. 8-in. 2,140 ft.; standardizing
Texon O. & L. Co.'s No. 1 Grisham-Hunter-B, NW cor. W half SW Sec. 45, School Blk. 26 ..... Drlg. 1,930 ft.
Texon O. & L. Co.'s No. 2 Grisham-Hunter-B ..... Cem. 8-in. 2,506 ft.
White Eagle O. & R. Co.'s (was Gibson & Johnson's) No. 1 P. A. Lock, 1,320 ft. W of NE cor. Sec. 30, Blk. 74, NW of discovery well, elev. 2,830 ft. ..... Total depth 3,260 ft.; fish. for bailer.
Southern C. O. P. Co.'s No. 1 Ida Hendrick 3-T-67-A, C SW NW NE Sec. 4, Blk. B-12, elev. 2,784 ft. ..... Top lime 2,638 ft.; slight show oil 3,000-08 ft.; filled up 1,500 ft. sulphur water at 3,065-72 ft.; plugged back to 3,050 ft. but did not shut off water; waiting orders.
Southern C. O. P. Co.'s No. 2 Ida Hendrick 3-T-67-A .... Standardizing 2,646 ft.
Southern C. O. P. Co.'s No. 2 T-67 Ida Hendrick-F ..... Cem. 10-in. 419 ft.
Southern C. O. P. Co.'s No. 3 T-67 Ida Hendrick-F ..... Rig. rotary.
Southern C. O. P. Co.'s No. 4 T-67 Ida Hendrick-F ..... Rig. rotary.

Southern C. O. P. Co.'s No. 5 T-67 Ida Hendrick-C ..... Drlg. 875 ft.
Southern C. O. P. Co.'s No. 1 T-67 Hendrick-B, NE cor. SE Sec. 24, Blk. 26 ..... Top salt 2,210 ft.; top lime 2,645 ft.; total depth 2,648 ft.; rigged tools and shut down.
Southern C. O. P. Co.'s No. 1 Hendrick 3-T-68-A, SW cor. W half NW Sec. 35, Blk. B-5 ..... Top salt 1,365 ft.; top lime 2,303 ft.; top pay 2,440 ft.; shut down 2,740 ft.; no production; tools bridged hole.
Southern C. O. P. Co.'s No. 2 Hendrick 3-T-68-A ..... Standardized 2,288 ft. and shut down.
Southern C. O. P. Co.'s No. 3 Hendrick 3-T-68-A ..... First gas 2,400 ft.; 8,000,000 ft. gas 2,420 ft.; fish. tools.
Southern C. O. P. Co.'s No. 1 T-88 Ida Hendrick-C, NW cor. Sec. 28, Blk. B-5 ..... 6,000,000 ft. gas 2,665 ft.; fish. tools 2,875 ft.
Southern C. O. P. Co.'s No. 2 T-88 Hendrick-C, Sec. 28, Blk. B-5 ..... Top pay 2,805 ft.; drlg. 2,830 ft.; flowed 50 bbls.
Southern C. O. P. Co.'s No. 3 Ida Hendrick, T-88-C ..... Top pay 2,795 ft.; drlg. 2,805 ft.; hole full oil.
Southern C. O. P. Co.'s No. 4 Ida Hendrick, T-88-C ..... Cem. 6-in. 2,586 ft. and shut down.
Southern C. O. P. Co.'s No. 5 Ida Hendrick, T-88-C ..... Drlg. 2,520 ft.
Southern C. O. P. Co.'s No. 6 Ida Hendrick, T-88-C ..... Cem. 6-in. 2,528 ft.
Southern C. O. P. Co.'s No. 7 Ida Hendrick, T-88-C ..... Standardizing 2,435 ft.
Turman & Maxwell's No. 1 Ida Hendrick ..... Shut down for tankage 2,879 ft.; flows about 35 bbls. and 5,000,000 ft. gas.
Turman & Maxwell's No. 2 Ida Hendrick ..... 10,000,000 ft. gas 2,865 ft.; shut down.
Turman & Maxwell's No. 3 Ida Hendrick, E half NE Sec. 29, Blk. B-5 ..... Shut down 2,585 ft.
Turman & Maxwell's No. 4 Ida Hendrick ..... Rig. up rotary.
Southern C. O. P. Co.'s No. 1 Ida Hendrick, T-88-G, SW SE Sec. 28, Blk. B-5 ..... Location; moved material away.
Southern C. O. P. Co.'s No. 1 Ida Hendrick, T-88-I, SE cor. E half NE Sec. 30, Blk. B-5 ..... Drlg. 1,300 ft.
Southern C. O. P. Co.'s No. 1 E. G. Hutchings, T-90, NE cor. E half SE Sec. 47, Blk. 26 ..... Drlg. 100 ft.

WILDCAT OPERATIONS IN PANHANDLE

(Continued from Page 32)

Camel Oil Co.'s No. 1 B. E. McKinney ..... Rig.
Cole O. & G. Co.'s (was Magdalene Oil Co.'s) No. 1 J. E. Williams, Sec. 17, Blk. 1 ..... S.D., 3,860 ft.
Danciger O. & R. Co.'s No. 4 W. Jackson ..... Drlg., 2,995 ft. flowed 225 bbls 1st 24 hrs at 2,990-95 ft.
Danciger O. & R. Co.'s No. 5 W. Jackson ..... Drlg., 1,649 ft.
Danciger O. & R. Co.'s No. 6 W. Jackson, Sec. 88, Blk. B-2, H. & G. N. Sur. ..... Drlg. 422 ft.
Danciger O. & R. Co.'s No. 7 W. Jackson, Sec. 88, Blk. B-2, H. & G. N. Sur. ..... Drlg. 200 ft.
Danciger O. & R. Co.'s No. 8 W. Jackson, NE cor. NW, Sec. 88, Blk. B-2 ..... Rig.
Donley Gray Oil Co.'s No. 1 J. W. Gordon, Sec. 79, Blk. 3 ..... Wtr. 3,380 ft. and 3,420 ft; show oil; H.F.W., 3,650; S.D., 3,750 ft.
Delaney et al's No. 2 Jackson ..... 3,000,000 ft. gas, 2,590 ft., increased to 11,000,000 ft. at 2,760 ft. drlg. ahead.
Edwards et al's No. 1 E. J. Case, NE cor. Sec. 182, Blk. B-2, H. & G. N. Sur. ..... 70,000,000 ft. gas, 2,512-2,630 ft; drlg. by bit, 3,028 ft.
Gardner et al's No. 1 G. H. Saunders ..... Cellar.
Gibson Oil Corp.'s No. 2 J. B. Bowers ..... Drlg., 2,743 ft.
Gurnsey Oil Co.'s No. 1 B. E. McKinney ..... Drlg. 2,769 ft.
Gurnsey Oil Co.'s No. 2 B. E. McKinney, Sec. 163, Blk. 3, I. & G. N. Sur. ..... Rig on ground.
Lefors Pet. Co.'s No. 1 Leach, Lefors Townsite ..... 10,000,000 ft. gas, 2,440-50 ft; 70,000,000 ft. gas, 2,625 ft; T.D., 2,650 ft; trying to pull 8-in. and it parted; S.D.
H. C. McCauley et al's No. 1 J. Morse, Sec. 2, Blk. 46, H. & G. N. Sur. ..... Top lime, 1,770 ft; 10,000,000 ft. of gas at 2,352-65 ft., show of oil 2,400 ft., drlg. 2,406 ft.
Magnolia Pet. Co.'s No. 1 J. Bowers ..... Drlg. 1,023 ft.
Magnolia Pet. Co.'s No. 1 J. J. Wall, NE cor. Sec. 162, Blk. 3, I. & G. N. Sur. ..... Spud.
Midwest Explth. Co.'s No. 1 J. Bowers ..... Topped G. W. 2,785 ft., drlg.
Midwest Explth. Co.'s No. 1 L. Holmes, Sec. 86, Blk. 3, I. & G. N. Sur. ..... Rig.
Neudigate et al's No. 1 A. Chapman, NE cor. E ½, SE, Sec. 52, Blk. 25 ..... 500,000 ft. gas, 2,760-65 ft; rainbow of oil, 2,820-25 ft; salt wtr; G.W., 2,827-28 ft; S.D., 2,835 ft.
Operators Oil Co.'s No. 1 Jackson ..... Flowed 1,800 bbls. in 24 hrs. from beat G. W. pay, 2,967-84 ft., running 5-in to 2,990 ft. S. L. M.
Operators Oil Co.'s No. 2 W. Jackson, NW cor. N ½ NE, Sec. 88, Blk. B-2 ..... Building rig.
Phillips Pet. Co.'s No. 1 Davidson (Myson) ..... Spudding.
Phillips Pet. Co.'s No. 1 W. Jackson (was Clark et al's No. 2) ..... Drlg., dry gas sand 2,845 ft.
Phillips Pet. Co.'s No. 2 W. Jackson (was Clark et al's No. 3) ..... Drlg., 2,832 ft., 1,000 ft., oil in hole.
Phillips Pet. Co.'s No. 3 W. Jackson ..... Set. 12-in., 927 ft.
Phillips Pet. Co.'s No. 1 Jackson-Riley (was Clark et al's No. 1 W. Jackson) ..... 7,000,000 ft. gas, 2,442-2,545 ft; swabbed 160 bbls. at 2,981 ft. S. D. 2,942-54 ft.
Phillips Pet. Co.'s No. 2 Jackson-Riley ..... Drlg., 2,100 ft.
Phillips Pet. Co.'s No. 3 Jackson Riley, Sec. 88, Blk. B-2, H. & G. N. Sur. ..... Rig on ground.
Pampa Oil Co.'s No. 1 W. R. Campbell, Sec. 90, Blk. 3 ..... Drlg. 3,433 ft.; 700 ft water. 3,430 ft.
Purple Sage Oil Co.'s No. 2 E. B. Johnson ..... Spudding and S. D.
Remo Oil Co.'s No. 1 B. E. McKinney ..... Rigging up.
St. Clair Oil Co.'s No. 1 C. H. Rowe ..... Spudding.
Shamrock Pet. Co. et al's No. 1 J. B. Back, SE NW SW, Sec. 44, Blk. 25 ..... T.D., 2,360 ft; run 6-in.
Shamrock Oil Co.'s No. 1 W. S. Clayton ..... Rig.
Skelly Oil Co.'s No. 1 Bradford, NE cor. Sec. 118, Blk. B-2, H. & G. N. Sur. ..... Drlg., 300 ft.
Skelly Oil Co.'s No. 1 W. Jackson ..... 7,000,000 ft. gas, 2,780 ft. S. O. at 2,865-70 ft.
Skelly Oil Co.'s No. 2 Jackson ..... Cmt., 12-in., 1,100 ft.
Spartan Oil Co.'s No. 1 J. Hopkins ..... Rig.
Sullivan et al's No. 1 A. Chapman-A ..... Spudding.
Sun Oil Co.'s No. 1 Jackson ..... Drlg., 950 ft.
Staggers Oil Co.'s (was Ruby Oil Co.'s) No. 1 B. F. Tally ..... T.D., 635 ft; S.D.
The Texas Company's No. 1 J. B. Bowers ..... Drlg., 2,476 ft.
The Texas Company's No. 2 J. B. Bowers ..... Drlg., 2,452 ft.
The Texas Company's No. 3 J. B. Bowers ..... Drlg., 500 ft.
The Texas Company's No. 4 J. B. Bowers, SE cor. SE, Sec. 93, Blk. B-2 ..... New location.
The Texas Company's No. 2 H. M. Davis, SW cor. NW, Sec. 86, Blk. 3 ..... Rig on ground.
The Texas Company's No. 1 McLarty et al, SW cor. E ½ NW, Sec. 1, Blk. 1, A. C. H. & B. Sur. ..... Cellar.
The Texas Company's No. 1 S. McLarty ..... Rig.
The Texas Company's No. 4 G. H. Saunders ..... Drlg., 2,295 ft.

HALE COUNTY

Bailey & Young's No. 1 Thomas, Sec. 1, Blk. J.K.L. ..... S.D., 175 ft.
Donnell Pet. Co.'s No. 2 Mullican, NW cor. Sec. 66, Blk. A-3, I. & S. B. Sur. ..... Top pay in sandy shale, 405 ft; ½ bailer oil and 3 bailers wtr. per day; S.D., 620 ft.
Donnell Pet. Co.'s No. 1 Mullican, C Sec. 21, Blk. B, R. M. Thompson Sur. ..... 200 ft. fluid in hole from 407-14 ft; S.D.
Explth. Co.'s No. 1 Crawford, C NE, Sec. 17, Blk. C-3, T. T. R. R. Sur. ..... Spudded and S.D.
Explth. Co.'s No. 1 Goodman ..... Spudded and S.D.
A. S. Mimm's No. 1 W. A. Ritcher, 700 ft. from east line and 1,200 feet from south line, Sec. 17, Blk. X, John Glynn Sur. ..... S.D., 1,140 ft.
Tolbert & Simms' (was Gouldy & Stone's) No. 1 Kitteral, SE cor. NW, Sec. 65, Blk. A-3, G. C. & S. F. Sur. ..... S.D., 485 ft.

HALL COUNTY

Briscoe Oil Assn.'s (was Seifert et al's) No. 1 Owens, C NE, Sec. 179, Blk. S-5, Dennison & Pacific Sur. ..... Spudded and S.D.

HANSFORD COUNTY

Caldwell et al's No. 1 J. Adriance est. ..... Drlg., 583 ft.
Oklavania et al's No. 1 Coots, Sec. 13, Blk. 45, H. & T. C. Sur. ..... S.D., 560 ft.

HOCKLEY COUNTY

World Oil Co.'s No. 1 Ellwood ..... S.D., 1,455 ft.

HARTLEY COUNTY

Deep Rock Oil Co.'s No. 1 Lymann & Balfour, Sec. 9 ..... Preparing to abd., 4,038 ft.
Eslick et al's No. 1 J. R. Irving, Sec. 13, Blk. 13 ..... Topped G.W., 3,103 ft; show oil, 3,226 ft; hole full wtr., 3,745-55 ft; S.D., 4,000 ft.

HEMPHILL COUNTY

Hoover et al's No. 1 Schaller est., Sec. 4 ..... Spudded and S.D.
Hoover et al's No. 1 fee, J. S. Hood Sur. ..... Shut down, 4,835 ft.

HUTCHINSON COUNTY

R. G. Barnum et al's No. 1 Garland Sanford, Sec. 78, Blk. 46 ..... Rig.
Beam et al's No. 1 Cockrell, Sec. 3, Blk. 23 ..... S.D., 405 ft. for orders.
Big Coach Oil Co.'s No. 1 Dunnaway, Sec. 5, Blk. Y ..... S.D., 750 ft.
Conklin et al's No. 1 Johnson, Sec. 1, Blk. X-3, H. & O. B. Sur. ..... S.D., 600 ft.
Harris et al's No. 1 J. Q. Bost, Sec. 10, Blk. Y-2, T. T. R. R. Sur. ..... Rig.
Holmes & Quinn's No. 1 J. K. Quinn, SW cor. Sec. 9, Blk. 3, B. S. & F. Sur. ..... Rig. U. S. D.
McMan O. & G. Co.'s No. 1 Albert Yake ..... Fish, 1,500 ft.
Phillips Pet. Co.'s No. 12 Elva-Whittenburg, E. Tomlinson Sur. ..... T.A., 4,445 ft.
Phillips Pet. Co. and White Eagle O. & R. Co.'s No. 1 Lee Bivins ..... Top pay 2,994 ft., total depth 2,994 ft., swabbed 200 bbls. 1st 24 hrs.; to drill deeper.
Prairie O. & G. Co.'s No. 1 Burnett est (Clark) ..... Top pay, 2,955 ft.; T. D., 3,051 ft., swabbed 100 bbls. 1st 36 hrs.; to shoot.
Prairie O. & G. Co. and Vacuum Oil Co.'s No. 2 Cal Merchant ..... Drlg., 1,901.
Skelly Oil Co.'s No. 2 Armstrong & Byrd ..... Rig.
Skyrocket Oil Co.'s No. 1 Mrs. R. A. Jameson ..... Very small show of oil 3,105 ft.; small show of oil 3,114-29 ft.; drlg. 3,140 ft.
The Texas Company's No. 1 Cockrell-B ..... Drlg., 2,946 feet.
Timms et al's No. 1 C. R. Garner ..... Drlg., 1,831 ft.

KING COUNTY

Humble O. & R. Co.'s No. 1 Pitchfork, Sec. 171, Blk. A-96, John H. Gibson Sur. ..... Drlg., 3,253 ft.
J. L. Pattison's No. 1 Patton ..... Slight show gas, 2,115-30 ft.; fish 3,410 ft.

LAMB COUNTY

Dan Freel et al's No. 1 Ellwood, CWL Sec. 9, Blk. T. T. A. Thompson Sur. ..... Rig.
Tolbert & Simms' No. 1 Ellwood, NE SW SW, Sec. 14, Blk. B. R. M. Thompson Sur. ..... S.D., 712 ft; small show oil and hole full water.

LIPSCOMB COUNTY

Cal-Tex's No. 1 Bradford, C NE NE, Sec. 899, Blk. 43, H. & T. C. Sur. ..... Spudded and S.D.
Camp Creek Oil Co.'s No. 1 Mrs. H. D. May, Sec. 612, Blk. 43 ..... S.D., 1,400 ft.
McCorkle's No. 1 A. Barton, NE cor. SW SE, Sec. 504, Blk. 43, H. & T. C. Sur. ..... Wtr. in lime, 4,126-40 ft; 6-in set, 4,155 ft; drlg., 4,530 ft.
Ozark Drlg. Co.'s No. 1 Frass, NE SE, Sec. 106, Blk. 10, H. & T. C. Sur. ..... Rig on ground.
Smith, Kinsley & Ruby's No. 1 C. W. Jones, NE cor. SW, Sec. 100, Blk. 43 ..... Show oil, 3,520 ft; S.W., 3,900 ft; shut down 4,300 ft.

LUBBOCK COUNTY

Center Oil Co.'s No. 1 Bowles ranch ..... Small show oil, 1,133-40 ft., in sand; shut down 2,730 ft.

MOORE COUNTY

Amarillo Oil Co.'s No. 1 Thompson-Amarillo, Cen. Sec. 22, Blk. 26, E. L. & R. R. Sur. ..... Location.
Prairie and Shamrock's No. 2 Gober, Sec. 16, Blk. M-21 ..... T.D., 2,520 ft; recmt. 12-in., 1,525 ft; drlg. by tools.

MOTLEY COUNTY

Explth. Co.'s No. 1 Burleson ..... Spudded and S.D.
Explth. Co.'s No. 1 Tillson ..... S.D., 750 ft. for repairs.
Explth. Co.'s No. 1 Matador Land & Cattle Co., C SW, Sec. 37, John Gibson Sur. ..... S.D., 1,002 ft.
Wheeler et al's No. 1 C. D. Bird, C NE, Sec. 4, Blk. S, Stephens Sur. ..... Spudded and S.D.

OLDHAM COUNTY

Prairie O. & G. Co.'s No. 1 Landegrin, SE cor. NE SW, Sec. 46, League 310, Capital land ..... 1,900 ft. wtr., 4,085-93 ft; 1 bailer wtr. per hr. and light scum oil, 4,527 ft. (steel line meas.) cmt. 6-in., 4,442 ft; 2,000 ft. S.W., 4,850-56 ft.; drlg. 5,115 ft.

OCHILTREE COUNTY

W. G. Burton's No. 1 Strickler ..... Fishing 3,940 ft.
Hamilton et al, H. E. Wamble ..... Shut down, 250 ft.
McCorkle P. L. Co.'s No. 1 R. H. Moore ..... Shut down, 1,600 ft.
Montgomery's No. 1 Weinett ..... Shut down, 850 ft.
Standard Development Co.'s No. 1 Bowen ..... Shut down, 900 ft.

POTTER COUNTY

Frank Allen et al's No. 1 W. H. Bush ..... Drlg. 192 ft.
Prairie O. & G. Co.'s No. 2 Lee Bivins, 660 ft. N. and 330 ft. W. of SE cor. Sec. 39, Blk. M-20, G. & M. Sur. ..... Drlg., 979 ft.

RANDALL COUNTY

Westbrook Oil Co.'s No. 1 J. Beckman, SW cor. SE NE, Sec. 46, Blk. B-5 ..... Drlg., 620 ft.

ROBERTS COUNTY

Big Bend Oil Co.'s No. 1 Mrs. H. Ledrick & Sons, Sec. 7, Blk. 5-A ..... Show gas, 4,990 ft; show oil, 4,992 ft; cas. set, 4,992 ft; S.R. for 3-in. pipe; T.D., 5,153 ft.

SHERMAN COUNTY

Gibson Oil Co.'s No. 1 Bivins, Sec. 35, Blk. 3-B ..... 100,000 ft. gas, 2,016-26 ft; T.D., 3,353 ft; 2,000 ft. S.W., 3,325-33 ft; fish. for U.R. lugs.
Phillips Pet. Co. and Prairie O. & G. Co.'s No. 1 Price & Fuqua, C NE, Sec. 33, Blk. 2-B, G. H. & H. Sur. ..... 100,000 ft. gas, 2,105-10 ft; T.D., 3,420 ft; 2,000,000 ft. gas, 3,325-3,420 ft. lime; fishing.

WHEELER COUNTY

E. L. Arnold's No. 1 M. J. Williams ..... Show gas, 1,644 ft; T.D., 1,790 ft; fish. bit.
Byrens et al's No. 1 Johnson, SW cor. NE, Sec. 88, Blk. A-5, H. & G. N. Sur. ..... S.D., 450 ft.
Clark et al's No. 1 J. W. Gordon ..... Drlg., 528 ft.
Rook et al's (was Foster et al's) No. 1 S. H. McDonald, SE cor. NW SW, J. N. Lindsay Sur. ..... Spudding and shut down.
Hatcher et al's No. 2 J. Hatcher, C NE SW, Sec. 80, Blk. 23, H. & G. N. Sur. ..... Spudding.
Mid-Kansas Oil & Gas Co.'s No. 1 J. F. Coates, Sec. 92, Blk. 17, H. & G. N. Sur. ..... Location.
Mid-Kansas Oil & Gas Co.'s No. 1 J. L. Newton, Sec. 92, Blk. 17, H. & G. N. Sur. ..... Location.
Piney O. & G. Co.'s No. 1 W. S. Walker, Sec. 44, Blk. 24, H. & G. N. Sur. ..... Shut down, 1,893 ft. for 8-in.
Rook & Angus' No. 1 Smock (Linkey) C SE SE, Sec. 5, Blk. 24, H. & G. N. Sur. ..... Rigged up and S.D.
Smith Brady et al's No. 1 P. J. Sorenson, Sec. 53, Blk. A-4 ..... S.D., 2,120 ft. for orders.
The Texas Company's No. 2 Morgan, Sec. 92, Blk. 17. ..... Drlg., 1,093 ft.
Vaughan et al's No. 1 M. Ackley ..... Location.
Pete Woodley's No. 1 J. Boyle ..... Drlg., 338 ft.
Kaufold et al's No. 1 E. R. Wallace ..... Rig.
Watchorn Oil & Gas Co.'s No. 2 Binkley & Caine, Sec. 92, Blk. 24, H. & G. Sur. ..... Location.

Technical Questions Answered

BY CHARLES K. FRANCIS, PH.D., TECHNICAL EDITOR

This department of The Oil and Gas Journal is devoted to the manufacturing branches of the oil industry.

Those connected with the refining of crude petroleum, the manufacture of natural gasoline and closely allied industries are invited to submit their problems to Dr. C. K. Francis, technical editor. The department was created for the purpose of aiding managers, superintendents, engineers, chemists and all those engaged in the various phases of plant operation; also those connected with the marketing and utilization of petroleum products.

Questions should be submitted in as much detail as possible so as to assure a satisfactory answer.

All inquiries should be signed and if other than the given initials are to be used please indicate the desired letters.

Questions involving patented processes, intricate formulas and calculations and estimates of costs, for obvious reasons, cannot be answered. The replies will appear on this page within a reasonable time.

STODDARD SOLVENT

What is the distilling range of the special naphtha known as Stoddard solvent? Is there a gravity specification for this product?—G. L. T.

The specifications covering the quality of Stoddard solvent have very recently been revised to be effective March 1, 1928. The only points mentioned for distillation range are the 50 per cent point and the endpoint, these are 350 degrees Fahrenheit and 410 degrees Fahrenheit. Gravity is not specified. The complete specification follows:

Appearance—Shall be clear and free from suspended matter and undissolved water.

Color—Water-white; not less than plus 21 Saybolt.

Corrosion—A clean copper strip shall not show more than an extremely slight discoloration when submerged in the solvent for three hours at 212 degrees.

Odor—Shall be sweet.

Flash Point—Shall not be lower than 100 degrees Fahrenheit when tested in a Tagliabue closed cup.

Distillation Range—Not less than 50 per cent shall be recovered in the receiver when the thermometer reads 350 degrees Fahrenheit. The dry or endpoint shall not be higher than 410 degrees Fahrenheit.

Acidity—The residue remaining in the flask after the distillation is completed shall not show an acid reaction.

Doctor Test—Negative.

Unsaturation Test—To be arranged by a committee.

USE OF STEAM JET

We have under consideration making certain changes in our crude oil battery which consists at present of six 500-bbl. shell stills. These changes will probably include new bubble towers on some of the stills. We would like to have information as to the practicability of using the steam jet in the transfer of liquids —R. H.

The steam lift is constantly having a wider application in the transfer of hot oils. This is especially true in the rebuilding of old shell stills where new fractionating equipment is to be installed. In the Mid-Continent the steam lift is being used to transfer the hot residuum from still to still and in transfering the reflux from tower to tower. Another application consists in jetting the residuum from a still to the stripping sections of bubble towers.

In the application of the steam jet it is of course necessary to design the equipment so that the transfer lines have a leg of oil below the liquid level of the still or tower from which the residuum or reflux is obtained. The steam is introduced or "jetted" into the transfer line in the direction of the flow of the liquid. A one-half-inch steam line is generally considered adequate for a 4-inch transfer line with a three-eighths-inch line for a 6-inch.

A test made at an Oklahoma refinery showed with the steam jet about 1 pound of steam was required per barrel of oil transferred. The quantity was required both in a still to still and a tower to tower transfer. The quantity of steam used compared with 5 pounds of steam per barrel of oil with a rotary pump and 15 pounds per barrel of oil with an ordinary type reciprocating pump. In addition to the saving in initial investment and the quantity of steam used, advantages are claimed for the steam jet in that there is practically no maintenance. Properly installed no trouble has been experienced in the operating end.

Another operating factor is based on the fact that the injection of the steam into the oil tends to decrease the partial pressure of the oil. This fact is responsible for the direct introduction of steam in many of the distilling operations of the past. It enables the operator to maintain yields at lower temperatures.

PRICE DIFFERENTIALS

I am dependent upon your journal and other publications for the prices set for U. S. Motor gasoline and the other grades but I do not think the price differentials between the various grades represents the actual difference in my manufacturing costs and I would like to be able to figure the cost of making each grade in order to take advantage of any market changes by altering my operations accordingly.—P. L. C.

Ordinarily a refiner is obligated to make the grade of gasoline he is able to sell and there is an advantage too in making the same grades of gasolines which facilitates a uniformity of operations but these factors can best be applied in your case by yourself. The principal factors to consider in changing your operations to make the various grades of gasoline is the difference in the yields of not only gasoline but kerosene and possibly others. Obviously if you make a U. S. Motor gasoline regularly and then start making a 375 endpoint gasoline the yield will drop and the kerosene yield will be correspondingly increased. This change also changes the quality of the kerosene, making it more volatile and should be better quality.

In addition to the difference in yields and quality the difference in the cost of using natural gasoline often proves the deciding factor in whether the change should be made. By trial over a month's time you should be able to set an accurate estimate of your yields when making a maximum of each of the various grades of gasoline and from these yields make a realization statement showing the revenue derived from each barrel of similar crude refined under each case, using the current market quotations for the various products.

This comparison will show which method of operation yields the highest gross revenue and then about the only factor to consider is the cost of using natural gasoline in each case. If you are able to buy natural gasoline and have it delivered at a price below what you can secure for the blend, the gasolines using the highest percentage of natural gasoline will of course be the most advantageous to make. It is entirely possible that it may be cheaper to make 64-66 375 endpoint gasoline than 60-62 390 endpoint gasoline. Although this is possible, it is rarely the case and a point to carefully check in the practical application of this is the extent of evaporation in the handling of the added volume of natural gasoline.

QUALITY OF FUEL OIL AND ROAD OIL

We bought several cars of fuel oil this year to keep the dust down on the dirt roads but it did not seem to be as effective as the oil we bought last year. We bought fuel oil this year because it was cheaper than the road oil quoted us although the two samples looked the same to me. Please tell me if there is any difference between fuel oil and road oil. —City of J.

There is a decided difference between ordinary fuel oil and good road oil. Although there are no set specifications for the latter, refiners and large users of road oil have made independent investigations and have agreed upon several points. These include characteristics not found in fuel oil and not essential for fuel oil. Briefly stated, good road oil should be practically entirely soluble in carbon disulphide. A requirement of 99½ per cent is the specification set by the Illinois State Highway Commission and this is generally accepted for the better grades. Ordinary fuel oil will seldom pass this specification. This requirement guarantees a clean oil free of dirt and the oil may be sprayed uniformly and most effectively.

A high asphalt content is required, namely from 50 to 70 per cent. Ordinary fuel oil will not meet this unless made from California or Gulf Coast crudes. A high asphalt content is preferred as it serves as a binder and turns water more effectively. In this way it not only settles the dust but forms a harder surface for the road.

Ordinary fuel oil will usually have a higher rate of evaporation than good road oil and this disadvantage is self evident. There are other distinct differences between road oil and fuel oil, necessitating special processing of the former at an added cost to the refiner and a higher price is justified if the road oil meets these special requirements.

COLORING GASOLINE

I would like to add coloring matter to our premium grade of gasoline to distinguish it from the other grades sold but the refinery from whom I buy the gasoline objects to my doing this in their cars for they say it is then necessary to clean them before reloading. My tanks are underground and I prefer to add the dye to the car when received as it gives me a better control of the color and gives a better mix. Can you suggest a way I might handle this?—H. McK.

If you have not chosen a color for your gasoline you might use green or blue. These two colors do not show up as a discoloration when the cars are reloaded as in the case of red or yellow. It would be well to give this suggestion a trial, however, in co-operation with the refinery. There are certain blue coloring matters which are quite satisfactory because in very small quantities, such as the traces which might remain in a car, they behave as bleaching mediums. When small quantities of yellow are present these may be neutralized but if appreciable yellow color is present either in gasoline or kerosene the final product upon the addition of blue will be green.

It is not necessary to have the gasoline colored at the refinery. Knowing the size of your storage tanks and the volume of gasoline placed in storage, a simple calculation may be made which will enable you to make the desired mixture. A weighed quantity of the dye should be dissolved in gasoline, say 5 to 10 gallons; then by experimenting with small lots of the gasoline and known amounts of the dye solution it will be possible to establish the quantity necessary to produce the desired tint. When this quantity is once determined on a gallon or barrel basis the contents of the storage tank may be easily brought to the standard color whenever a new shipment is received.

WATER WHITE COLOR OF KEROSENE AND GASOLINE

Will you kindly give the meaning of the different grades of color for kerosene and gasoline? Is water white a definite grade of color as applied to kerosene and gasoline? Is any superior quality indicated in a gasoline having a higher color number than a high-grade kerosene?—S. T. E.

It is the common practice in the United States to indicate the color of both gasoline and kerosene by color shade numbers which are determined by means of the Saybolt chromometer. In the early days of the petroleum industry kerosene was the important product and a rough grading of color was made in descriptive terms. These were water white, prime white, standard white, lily white, cream white. As these terms would frequently lead to misunderstandinngs it became necessary to utilize better standards, that is something more definite. The color shades or numbers of the Saybolt instrument have been generally adopted for this purpose. The old descriptive terms and the equivalent Saybolt numbers are shown in the following:

Term—	Saybolt Number
Water white	plus 21
Prime white	plus 16
Standard white	plus 1
Lily white	minus 11
Cream white	minus 24

These descriptive terms and their equivalent Saybolt numbers have been so long recognized that both continue to be used in the industry. However, it is much better when a 21 color or better color is desired to specify 21 color or better and not simply water white. A specification of this kind is always intended to mean a minimum; a somewhat lighter shade may be furnished.

When the term water white color is applied to gasoline, without other description, the color equivalent to Saybolt 21 should be accepted as the minimum shade intended. Color seems to be growing less important because we find on the market gasoline of every possible color, and the normal shades vary from at least Saybolt plus 16 to plus 30.

In a general way it may be true that the absence of color, or the grade of color, is an indication of purity, including the completeness of the refining operations. However, many refiners separate gasoline from their crude oil which is exceptionally free from color, testing between plus 25 and 30 Saybolt. Sometimes the refining process, while removing some objectionable substances, does actually lower the color grade. Color alone cannot be considered a criterion of quality.

SMITHSTEEL

Pressure Vessels Are SMITHWELDED (Patented)

More than 500 Smithsteel Vessels are operating as cracking stills in oil refineries. Each unit is subjected to the most severe and varied conditions ranging in pressures up to 600 pounds per square inch at temperatures up to 900 degrees. All of them are *SMITHWELDED (Patented)*

The greater freedom from limitations of design, size and shape secured in Smithsteel Pressure Vessels for all phases of oil cracking is due to the process of fabrication, that is, SMITHWELDING.

A. O. SMITH CORPORATION
General Offices—Milwaukee, Wisconsin

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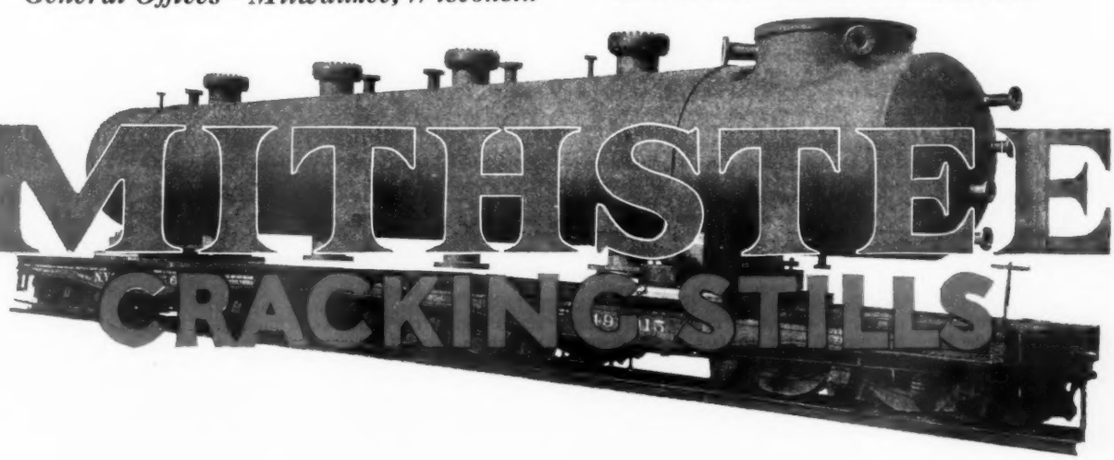

SMITHSTEEL CRACKING STILLS

New Uses for Petroleum Products

Several Outlets Awaiting Development by Oil Industry. Will Aid in Solving Overproduction Problems

By Harry D. Frueauff*
Henry L. Doherty & Co.

By far the largest potential opportunity to increase the consumption of petroleum products is through a more extensive and a much more concentrated campaign to heat as large a proportion of the homes of America as possible with distillates and fuel oil.

According to a recent survey of the United States there are over 15,500,000 homes wired for electricity. Discarding those homes located in sections where climatic conditions do not require its use or where especially cheap coal and exceptionally cheap natural gas is served, a large potential market is still left. Here again, as in most every other field that is consuming petroleum products, someone else has been doing what little work has been done. It is true that a few of the major companies have aggressively got behind a burner, and through their engineering department and their promotion department have aided in this work, but the major part of the more aggressive work that has been done has been accomplished by the builders of oil-burning equipment.

These equipment burner manufacturers, some 300 in number, have spent an enormous amount of money in advertising and promotion work to create a market. Because of its competitive nature and the pioneering work that had to be done, the cost was considerable and has materially increased the cost of installations of burners now being sold.

During the past year we have seen a number of combinations made of the relatively strong oil-burner companies which may, for a time, aid them in their aggressive work and may possibly build up a load factor that will give them a low unit of production costs. During the past year some support was given to these manufacturers in the promotion and advertising work that was being done to educate the American people upon automatic house heating, but this cannot be put across in a good, strong, resultant way while there are so many manufacturers engaged in it whose sole object is the one time profit of first and only sale. In my opinion, the industry itself should be the ringleader in a centralized effort—first, to produce a sufficient quantity of burners to make low cost per unit possible, and second, to market them in a co-operative way so that the costs of selling will be relatively small, and thirdly, to render every possible service to the customer in securing the full benefit of the burner he has purchased.

Other Industries

Can we not be guided by the experience of other great industries in our efforts to develop this enormous market. It was not so very many years ago that the electric industry sold no appliances and made no effort to increase the consumption of their customers, and it was not until two or three large, well-recognized concerns took over the manufacture and distribution of electric appliances, helped by the promotion of new business departments of the central stations, that the electric industry began to increase its load.

Oil Company's Position

I do not want to convey the impression that I believe the manufacturers of oil burners should go out of business and the oil companies themselves should individually develop or take up a burner. I will leave that to the survival of the fittest, but do believe there are certain reasons why the main effort to get this business should be undertaken by the oil companies.

*Before American Petroleum Institute, Chicago.

SEEKING NEW MARKETS

It may sound idealistic, but it is my firm conviction that there is no reason why oil prices should have taken the big slump that they did during the past year, and this is equally true of past cycles comparable to this year.

Had the oil companies, one and all, on January 1, 1927, released from their sales organizations, as now constituted, every salesman; had they dropped from their advertising and promotion appropriations every dollar that they had planned and did spend in an effort to sell competing products and devoted their time, mental effort and money to the promotion of new uses for petroleum products, in my opinion, gasoline would be selling for just as much today as it was ten months ago. I am confident that additional uses and demands would have been created for other products of the barrel of crude that would not only have held down the quantity of products going to storage, but would have kept up the values of the balance of crude so that householders, marine and gas companies and other large consumers would be paying a normal price for their fuel that would be in competition only with substitute fuels and not with a similar product sold by other companies.

The reason gasoline is cheap today is not because of overproduction, as is easily proven by statistics, but because the oil industry is apparently being run as a charity organization. By their own competitive methods of taking business from the other fellow, the oil men have gradually broken down the price structure until it is unprofitable and carrying with it diminished prices on all other products from a barrel of crude.

A thorough study of the many possible ways in which the situation can be improved must lead one to the acceptance of two fundamentals as regards the future of the oil-burner industry.

1. The oil burner must be merchandised by an organization.

2. That organization should undoubtedly be an oil company.

The general price of oil burners today is entirely too high and it is believed that in many cases where the equipment is sold in large quantities through the larger oil companies it is possible to reduce the selling price several hundred dollars.

Advantages

It might be of interest to say a word concerning the advantages to be obtained by the oil company in merchandising oil-burner equipment.

1. The oil burner offers a tremendous potential market. The gross revenue that can be obtained from a home owner is twice as much as that usually obtained from the sale of gasoline. The average home owner of an automobile uses about $100 worth of gasoline per year at 20 cents per gallon. The average home owner using oil for heating purposes will consume 2,000 gallons per year at 10 cents per gallon, or a gross revenue twice greater than that obtained from the sale of gasoline.

2. The oil company in merchandising oil burners is in a better position to secure a definite part of the business available and with less competition. In selling an oil burner the oil company can make proper contract arrangements with the customer to supply him with oil and thus eliminate to a marked degree the problem of competition from other companies.

3. The oil company in merchandising oil burners has under its control the option of expanding its sales of house heating oil just as fast as it desires. Under these conditions it is not necessary for the oil company to compete with other oil companies in the community. Neither is it necessary to limit its sales of oil in any territory because, as a rule, the local oil burner dealers are not making much progress promoting oil-burner sales.

4. The oil industry in selling large quantities of oil for house heating will be of assistance in selling oil for all other heating purposes, particularly in those industries in which oil can be used satisfactorily and economically.

Aviation

I had the privilege a few weeks ago of going over quite a comprehensive study of the possibilities of aviation in the United States. Those who made the survey studied the characteristics of an aviator as determined by the work done during the war in training such men. They computed the proportion of the population between certain ages, both male and female, that could be trained for this service. They studied the possibilities of the price of airplanes.

They gave a good deal of time to the study of the American characteristics of speed and novelty. They gave considerable attention to the thought that in order to avert war one must be prepared for war, and that the development of commercial and pleasure aviation was one of the best ways of achieving the result.

One Million Airplanes

As the outcome of this detailed study of aviation the authors state as their opinion that by 1950 there will be in the United States at least 1,000,000 airplanes in commercial and military service. This means that while today there is one airplane, military or otherwise, to every 15,000 people in the United States, by 1950 there would be one to every 150 people. The estimated consumption of gasoline in 1950 from this source alone figures out 1,000,000,000 gallons and 100,000,000 gallons of lubricating oil.

Marine Use

Lloyd's Registry of Shipping for 1927 shows that in the entire world there are something over 63,000,000 gross tons of ships operating. Of these, 18,500,000 are oil-burning steamers and 4,270,000 are motor ships, so that today 36 per cent of the marine operators are already using oil for fuel. Our engineers tell us that even at prices 50 cents higher than today's bunker prices, oil burning is of an advantage to the operators of ships. At today's prices we are giving back to the operators of those ships this enormous amount of money.

In this use the oil people have certainly done their part—few, if any, ships transporting oil use no other fuel. By converting our salesmen into engineers, we should be able to get more of the operators of marine fleets to see the advantages of oil. Here is an enormous opportunity. We may never secure 100 per cent of the marine fuel bill for oil, but if the present quantity were even doubled, and that is within the realms of possibility, an additional 75,000,000 to 100,000,000 bbls. of oil would find a profitable market.

Road Building

There seems to be a fairly general opinion that the efforts of the concrete manufacturers have pushed aside the asphalt people in the building of roads. While on the main highways this is somewhat true, in total roads built, both in cities and on main highwawys, we find that in 1919 there were 55,000,000 square yards of asphalt pavements laid and 52,000,000 of cement. In 1926, 133,000,000 square yards of asphalt pavements were laid as against 109,000,000 of cement.

Roads and more roads, both main and connecting arteries, are extremely important, as I have already pointed out, and it seems to me that the oil industry could well afford to see that all of their men are well versed in the points of superiority of asphalt roads over concrete, for individuality and collectively, they can do much to popularize this additional consumption of petroleum products.

Bus and Trucks

We have seen in the last few years quite a development in the use of the bus, first, for short distance transportation, then as feeders to other means of transportation, and still more recently for transcontinental transportation.

The same thing is observable in freight routes between nearby suburban towns and which are gradually being extended as better roads are developed. They have the advantage of doorstep to doorstep receipt and delivery. At present a fair proportion of all passenger travel and all freight transportation is moved by gasoline. How much, if any, of this development has been done by the oil industry, that is, in the sense of putting its engineers to work in studying the economics of this service and giving the bus operators the benefit of their co-operation?

Both passenger and freight transportation, in my opinion, is in its infancy. As our roads are lengthened and improved and their number increased, the greater will be the consumption of our oil products. Can't we, as an industry, give thought, backing and engineering help to the development of motor transportation on a safe and sound economic basis and thus add greatly to the volume of yearly business?

See America by Auto

Would it not be feasible for the institute, or the industry, to father a nation-wide movement by advertising and such other promotional activities as could be devised, to launch a movement to get people to spend their vacations in seeing the United States and Canada by auto?

The advantages of going where you please and when you please, of seeing the best parts of the country as you ride along rather than the freight yards and dumps seen in much of the eastern railway travel, and of enjoying the open spaces, all lead me to believe that such a movement could be made a very pop-

(Continued on Page 157)

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Of Interest to Sales Departments

MINOR CHANGES SO FAR THIS YEAR IN EXPORTS

With the exception of fuel oils and gas oils there has been relatively little change this year over last in the volume of refined products exported by refineries in the United States. The exports based on the available reports from the Bureau of Mines are shown in the accompanying table.

Gasoline exports the first 10 months of this year only increased 1,424,000 bbls. or approximately 3 per cent over the same period last year. This small increase this year contrasts with an increase of 40 per cent in 1926 over 1925. The increase in 1926 was as abnormally large as this year's increase is exceptionally small. The small increase this year is explained in part as due to the fact that foreign refineries have been enlarged and new plants built so that a larger percentage of the foreign gasoline demand is being supplied by plants located in foreign countries.

There has been an actual decrease in exports of kerosene so far this year the decrease amounting to approximately 10 per cent. Exports are more important in the kerosene market than in the case of gasoline. Kerosene exports normally amount to approximately 35 per cent of the total domestic production in the United States while in the case of gasoline exports are about 10 per cent of the total demand.

Exports of fuel oil and gas oil have increased 30 per cent so far this year over last year. These figures include shipments to territories contiguous to the United States where the bulk of the increase is said to come. The steady increase in the use of fuel oils as fuel for water transportation accounts for the increased demand this year.

Exports of wax decreased 4,719,000 pounds this year or a little less than 2 per cent. It is expected that the low prices now prevailing will result in a material increase in wax exports next year.

Table showing exports of principal refined products first 10 months of 1927 and 1926. Data given in thousands of barrels with exception of wax which is reported in thousands of pounds.

	First 10 mo.		
	1927	1926	Increase
Gasoline	37,564	36,140	1,424
Kerosene	16,422	18,270	*1,848
Fuel and gas oils	39,507	29,501	10,006
Lubricants	8,210	7,701	509
Wax (lbs.)	276,226	280,945	*4,719

*Decrease.

NOVEMBER AUTO OUTPUT

Anticipating the quantity production of the Ford cars within the next few months, other manufacturers have curtailed operations as seen from the report of the Automobile Chamber of Commerce for November. The output of motor cars and trucks in the United States for November has been estimated at 125,300 as compared with 229,725 for October, thus showing a decline of 45 per cent. In November of last year the corresponding production amounted to 260,778. The output for the first 11 months of this year has been estimated at 3,375,231 cars.

INCREASE TAX

New Hampshire has increased the gasoline tax from 3 to 4 cents effective January 1, 1928. There are now 18 states with tax of 4 cents or more and on the basis of the present average service station price this tax is approximately 25 per cent of the purchase price of the gasoline.

Short Talks on Specifications

By W. T. Ziegenhain

SAMPLING OF PETROLEUM PRODUCTS IN CARS OR TANKS

The correct sampling of refined oils is of equal importance with that of testing them accurately and in many cases too little is known of this practice on the part of the salesman and the laboratory results are misleading. This may easily happen when the company is investigating a complaint and the salesman is sent to collect a representative sample of the material in question as the basis of an investigation at the refinery and for the settlement of a claim or complaint. Ordinarily a complaint is not made unless something is wrong.

After the complaint is made it may either be the result of a mistake made at the refinery or at the customers' plant. A representative sample of the oil will ordinarily allow the laboratory to locate the cause. If the oil under complaint is in the tank car, the trouble can probably be traced to the refinery processing and testing or to loading in a dirty car, while if the oil is already in the customer's tanks it is likely to have been mixed with other oil, previously in the tank or lines and the complaint involves many more factors.

If the oil is still held in the car and the salesman is sent to investigate the complaint, he should not accept a sample given him unless he is satisfied the sample bottle or other container was clean and the sample correctly taken. It is still common practice, in many cases to draw a sample from the unloading leg of the car. This is not a fair method of sampling and many times the investigation of a complaint will show the trouble lies in the customer securing his sample in that manner. In transit, small particles of rust and water will collect in the unloading leg of the car almost without exception, and the first five gallons of material unloaded will be off color or hazy. This is practically unavoidable.

Good judgment and experience are the principal requisites in correct sampling and no set rules can be adhered to no matter how explicit they might be. Rules can not be made to fully cover the many conditions which might enter into the procedure to follow, but the American Society for Testing Materials has outlined the more essential factors to consider and when followed will be found to guarantee as representative sample as practically possible consistent with the adoption of this method for regular practice where time and the number of samples become a factor in the routine of testing. This procedure applies particularly to sampling tank cars and vertical tanks of the ordinary type.

The sample bottle used should have a capacity of at least one quart and should be set into a carrier made of lead as shown in the accompanying picture. A tightly fitted stopper made of cork and fastened to a string is an important part of the apparatus. Assuming the bottle is absolutely clean, it is even then good practice to rinse it out at least once with the material to be tested, discarding the wash oil.

Three samples of the oil should be taken, one called the bottom sample should be secured at a point about nine-tenths of the distance from the surface of the oil to the bottom of the tank. Another sample should be taken in the middle of the car or tank while the third sample is taken at a point about one-tenth the distance from the surface of the oil to the bottom of the tank.

Each of these should be collected in separate bottles by lowering the bottle to the required depth and then pulling the cork. After the bottle is full it is withdrawn and tightly stoppered. The three samples are then taken to the laboratory for mixing and testing. If the oil is taken from a tank car it is obvious, more of the middle sample should be used in making up a representative composite sample than the other two so the general rule to follow is to mix one part each of the bottom and top samples with eight parts of the middle sample.

In sampling vertical tanks the proportion is changed to one part each of the top and bottom samples and three parts of the middle sample. The composite sample should be adequate for testing and should not be less than a quart for the ordinary routine testing.

If samples are to be kept for a long time before testing they should be kept out of the light and tightly stoppered.

WIDER UTILIZATION IS NEEDED IN INDUSTRY

A plea for co-operative research for the extension of sales in the natural gasoline industry was made by Dr. E. R. Lederer, vice president of the Texas Pacific Coal & Oil Co., before the American Petroleum Institute in Chicago as the solution of the present poor market conditions. Relative to the problem, Doctor Lederer said:

"Since the beginning of the serious decline of gasoline prices in the summer of 1926, natural gasoline prices have followed very closely, and sales managers, I asked, feel that the price of U. S. Motor gasoline will remain as the top price for natural gasoline, or very close to it. Right now quite a number of refineries are shut down; a large percentage of the cracking capacity is idle. This means a smaller demand for casinghead gasoline; our production of this commodity, however, goes on; we cannot shut down our plants or reduce our runs without losing or wasting away our costly raw material. Our highly volatile finished product is much harder to store than the refined oils.

"The modern cracking units and their highly developed fractionating equipment produce finished gasoline, which betters U. S. Motor specifications and needs no blending with natural gasoline. Mixed with straight run gasoline it improves it and reduces again the percentage of natural gasoline, which otherwise would be required to bring it up to specifications. The amount of natural gasoline required for blending a high-gravity export gasoline has also been greatly reduced. The foreign market is realizing more and more that U. S. Motor specification gasoline is good enough for their use.

"The association took the first step in meeting this situation when it solicited over a year ago, from its members, funds for natural gasoline research. This scientific work has not only convinced our own members, but refiners, jobbers and marketers, and to a certain extent the general public, of the real value of natural gasoline as a component for motor fuel. The refiner is still hesitant to use more of our product for blending than absolutely necessary to meet the present U. S. Motor specification. We are sure the time is not so far off when gasoline will be sold on performance rather than on specifications, which alone cannot much longer be a criterion of 'good gasoline.' Some departments of our Government are already considering seriously to buy lubricating oils this way and motor fuels will soon follow. Vapor phase cracking—the new menace for our industry—is far off yet to become common refinery practice and furnish a large quantity of perfect motor fuel.

Reducing Costs

"Other industries are making continual surveys and studies how to reduce cost of production. Right now large refineries are replacing small or inefficient units—especially crackers and shell stills—with more efficient, larger ones, in order to multiply the original throughput and produce much more gasoline at lower costs, which will net them a profit even at low tank car prices. No doubt our modern plants are quite efficient, but I know that production costs even in the best-equipped plants are dangerously close to the market price. I believe there is a possibility in most plants to reduce manufacturing costs by careful study of equipment, operation overhead, etc. Of course, smaller manufacturers cannot afford to employ high-priced, trained and experienced engineers to make these studies and recommendations; here might be an opportunity for the association to step in and employ a good consulting engineer, for whose work the different manufacturers who use his services can prorata reimburse the association.

"Only a few of the largest manufacturers of natural gasoline employ a research staff of their own and have developed and placed on the market good aviation fuels. The increasing number of flight hours should gradually absorb some of the surplus, although at present consumption of aviation gasoline represents only one-half of one per cent of all gasoline produced. If we survey other industries, like the gas, electric, cement, brick, steel, leather and a good many others, we will find that they maintain research laboratories of their own, financed by contributions from their members, and this research has proven a necessity and has made millions of dollars for them in savings, development of new products and scientific marketing. The petroleum industry started such a research program some time ago. I do not think the natural gasoline manufacturers can and should wait until their problems will be studied by this research committee.

"But this industry can certainly do—though in a much smaller way—what the other industries did. As suggested in one of the directory meetings of the association, fellowships can and should be established, at very nominal cost, at several recognized universities, to find other uses for natural gasoline, its constituents and residue gas. There is a wide field open yet for chemical research, which might develop varied use of our commodity for solvents, chlorohydrocarbons, cyclic hydrocarbons and acetic acids, alcohols and many other valuable products."

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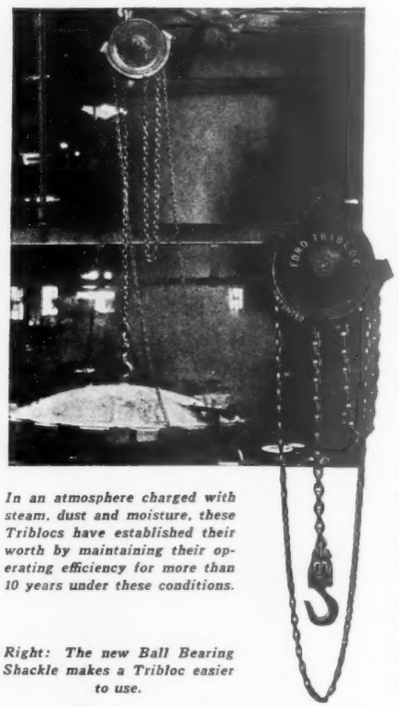

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STANDARDIZATION COMMITTEE MAKE REPORT ON WORK. TO MEET IN JUNE

The usual semiannual meeting of standardization committees of the American Petroleum Institute will be held at Colorado Springs next June, according to a decision reached at the eighth annual convention of the institute in Chicago. It was also suggested that if any other midyear meetings of the institute are necessary relating to other work that consideration be given to Colorado Springs as many members of the standardization committees also are members of other technical committees and it would reduce expenses considerably if all such committee meetings could be held at one place.

The following are the summarized reports of the various standardization committees that met in Chicago during the recent convention of the institute:

Belting

A. H. Riney, Chairman

The main purpose of the sessions at this meeting has been to examine carefully all of the existing specifications on belting with a view of accepting criticism from every angle in the hope that final forms could be adopted at this time. In accordance with this plan the initial session of the engineering subcommittee was held to discuss the two remaining tentative specifications, namely, those covering solid woven hair and solid woven cotton types. At the same time representatives of the manufacturers of all six types of belting met with the purpose in mind of suggesting revisions for these specifications. Due to the fact that there has been some objection regarding the limitation of minimum elongation of belting under tests, the following motion was passed:

That the engineering subcommittee go on record as feeling that although they are specifying on best types of present belting, we do not discourage development of new belting of any type which has initial elongation curves falling below the minimum prevailing specifications.

The fact that manufacturers have gone thoroughly into the study of the various types of belting was clearly evidenced in the separate sessions which were held by the engineering subcommittee and the representatives of each particular type of belting. As a result of those individual conferences, several revisions are to be made in the present specifications, most of them being only of minor importance.

The reports of the special engineering assignments on testing methods for belting, on belting records, on belting markings and on belting clamps, indicate that considerable progress is now being made on practical refinements along the subpect of belting specifications.

The following are some of the most important accomplishments of this session:

1. The completion of the specifications for solid woven cotton and solid woven hair belting as final, which now makes all of the specifications for belting final.
2. The adoption of standard equipment and methods for uniform testing of belting.
3. Final agreement with the pumping committee and the rigs and derricks committee for the belting center between band wheel and driving pulley of 35 and 40 feet and for the centers between motor or engine pulleys and counter shafts as 18 feet.

The following items are the most important ones upon which future attention will be directed:

1. Further study of the elastic properties of belting.
2. Development of fatigue tests for belting.
3. Additional standardization of the equipment and methods of testing.
4. Formulation of proper field usage standards, such as design of clamps and care of belting under operating conditions.
5. Preparations for use of manufacturers and users of standard test forms for presenting belting tests results.
6. The supplying of standard forms for users for recording field performances of belting.

Oil Field Boilers

S. J. Dickey, Chairman

The following additions were made to the present specifications:

1. Standard dimensions of hand-hole openings.
2. Design of stack flanges.
3. Location of pressure gauge opening.
4. Several internal clearance dimensions.

Several minor changes were made in the lists of standard fittings to accompany A.P.I. boilers.

The following questions were referred to the district committees:

1. Shall we add a 100-horsepower boiler?
2. Purchaser to specify desired operating pressure above that now specified.
3. Making safety valve flange location optional.

The manufacturers' committee was requested to furnish detail dimensional specifications for bonnets.

A special subcommittee was authorized to correlate the various material received into a recommended code covering the installation, operation and care of oil field boilers, together with a summarized poster covering this.

The A.S.M.E. boiler code committee reports final adoption of code changes permitting the installation of larger domes when located over the barrel of the boiler.

Cable Drilling Tool Joints

Thomas Fleming, Jr., Chairman

The chairman announced that from all reports received the use of cable tool standard joints was progressing quite favorably and that very few of the users had expressed dissatisfaction. He stated that to date a total of 630 A.P.I. cable tool joints, plug and ring gauges, have been supplied to manufacturers and operators, and that a total of 48 individuals and firms have been licensed to use A. P.I. cable tool joint gauges. Practically every manufacturer in the United States is now turning out joints in accordance with these standards It developed in the course of discussion, that in several localities the users of cable tools have insisted on maintaining certain dimensions of the wrench squares which are of minor importance, but which prevent the manufacturer from stamping the tools with the official A.P.I. designation. A resolution was adopted that the large operators insist on the purchase of cable tools which are strictly in accordance with the A.P.I. specifications as the manufacturers are compelled to furnish equipment in accordance with the demand of the customer, and are therefore powerless to furnish A.P.I. joints unless specified.

The principal business before the meeting was the consideration of a code on proper care and use of cable drilling tool joints in the field, and also the consideration of the advisability of adding smaller sizes of joints to the existing standards.

George H. Jaques, chairman of a special committee on the preparation of a code, submitted a very comprehensive report, which covered quite thoroughly and in detail the proper care and use of tools in the field. It was resolved that Mr. Jaques' report should be accepted by the committee, and then circularized through the entire membership of the committee for suggestions and advice, and for resubmission to the committee meeting at its next session next June. It is hoped that at that time the committee can adopt the code and recommend its approval to the institute.

F. J. Hinderliter, chairman of the special committee appointed at the last

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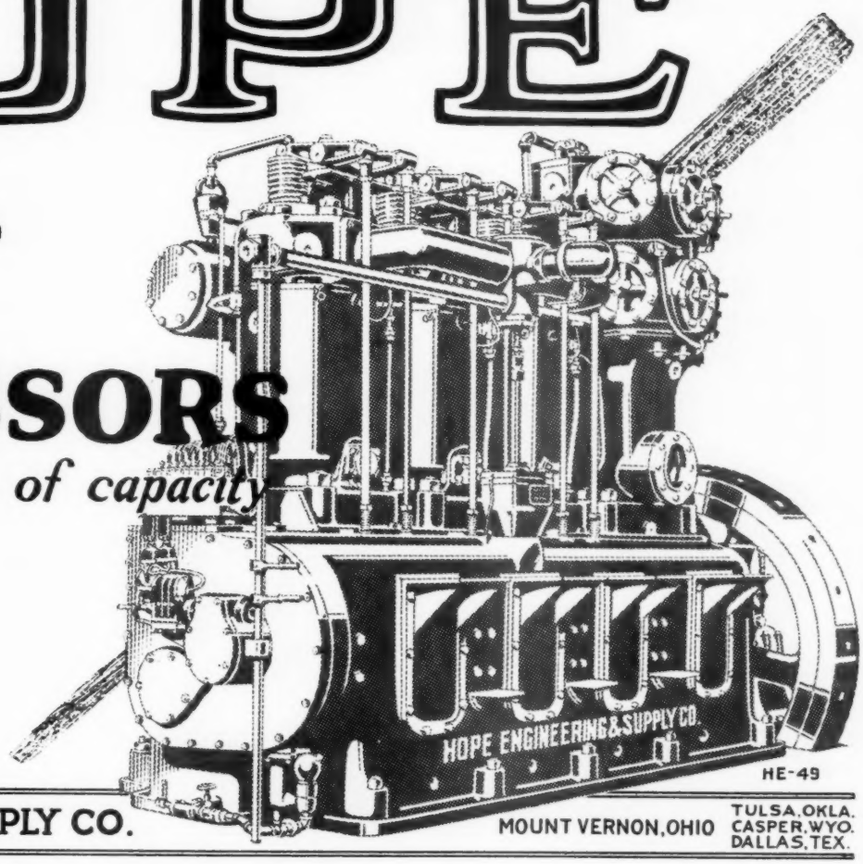

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meeting to consider the question of the adoption of several small sizes of joints, submitted a preliminary report and also placed before the meeting samples of three smaller sizes of joints which his committee felt would cover fully all requirements in smaller sizes. He supplemented this with a blueprint listing the proposed dimensional standards for these three sizes. During the discussion it developed that there was some difference of opinion as to the necessity for three sizes and also that there was some difference of opinion in reference to some of the dimensions. The committee finally decided to refer the data submitted by circular to the entire committee, with the request that both the dimensions and type of joints and also the requirements of these joints be considered by each member of the committee. This data will be further considered at the next meeting of the committee.

A request was made by one of the manufacturers that the sizes of the necks on all rope sockets both for manila and wire rope, be standardized by this committee, in the interests of fishing tool standards. The chairman appointed a special committee consisting of E. H. Williams, C. T. Mapes and F. J. Hinderliter to investigate and report on this subject at the next meeting.

Standard Rigs and Derricks

A. M. Bowman, Acting Chairman

The question of code was considered and a number of recommendations were made both verbally and in the form of letters. This committee had nine points to consider, six of which were disposed of and three left open for further consideration at some future meeting.

The first thing to be taken up later will be the question of headboards regarding which Mr. Timbs of the Union Tool Co. of Los Angeles, as chairman of the committee, made a report and submitted blue prints which were handed to the different derrick manufacturers that they might take them home and make a study of the dimensions recommended which will probably be accepted or rejected at the next meeting.

The second thing under consideration will be a report from the representatives of the different lumber manufacturing organizations, such as the Southern Pine and the National Lumber Association, these gentlemen having been appointed as a committee to undertake to make a classification or specification for wood which will give the large lumber manufacturers an opportunity to come into the picture with other woods than those which have been used mostly in the past. This report, on account of the magnitude of the work necessary to get it up in a comprehensive manner, will not be ready for some time.

Oil Country Tubular Goods

Charles Fitzgerald, Acting Chairman

Since the last meeting held at Colorado Springs, a considerable number of minor errors in the specifications have been detected and corrected. These changes were approved by the committee.

In STDS. 5-A (casing, drill pipe and tubing), the following changes were made:

References to drive pipe have been eliminated since it has developed that practically none of this material is now being used. It was necessary to do this or to add tables on sizes, gauges, etc.

It was called to the attention of the manufacturers that in some instances they have been marking A.P.I. tubing by its outside diameter instead of by its nominal diameter as stated in the specifications.

Three sizes of pipe previously adopted by the pumping equipment committee were approved by the pipe committee as follows:

Three and one-half inch plain (not upset.)

Three and one-half inch external upset.

Four-inch external upset.

The following action was taken in regard to STDS. 5-L (line pipe):

The question of correlating A.P.I. gauging practice with A.E.S.C. gauging practice was referred to the special committee relating committee on gauging and gauging practice, as was also the matter of authorizing the checking of gauges by the National Physical Laboratory at Teddington, England.

The entire tables of test pressure for both 5-A and 5-L specifications have been revised on the basis of one pressure being submitted for the old maximums and minimums. These tables have been further simplified by the consolidation of open hearth steel and grade "A" seamless steel in one table and wrought iron and open hearth iron in one table.

A progress report was received from the special investigating committee. Its proposals for a revised statement on the crushing tests was approved. There are several questions of interest in regard to pipe that are to be considered by the A.S.T. committee, of which Doctor Burgess is chairman. This committee has kindly consented to incorporate our problems in their schedule of tests, and to this end the committee approved the appointment of two members of our special investigating committee to become members of Doctor Burgess' committee and to present a list of tests in which we are interested. The remaining items referred to our special committee have been held over for further consideration.

A tentative draft of the code on the care and use of pipe has been prepared and will be submitted to a group of users and manufacturers during this meeting after which it will be put in final form and published, as it is considered important not to hold it over for the approval of the entire committee some six months hence.

Rig Irons

H. J. Lockhart, Chairman

The rig iron committee gave consideration to the bases of jack post boxes and reference should be made to page 23 of A.P.I. Standards No. 6, Third Edition, September, 1927.

At the bottom of the page referred to, you will note four dimensions, L, K, J and H applying to Figure 18 near the top of the page. These dimensions were tentatively adopted at the last semiannual meeting, subject to revision depending on the action of the standard rig and derrick committee at this convention.

Rotary Drilling Equipment

E. J. Nicklos, Acting Chairman

Specifications for swivel gooseneck hose conections as furnished by the engineering committee were approved.

Tentative specifications for line shafts in the 6½ and 7-inch sizes, as furnished by the engineering committee were approved.

The request for change in standoff value on rotary drill pipe was discussed at length and it was recommended no change be made in the present specifications.

Changes in depth of recess in pipe end of rotary tool joints were approved.

After investigation by the manufacturers and the engineering subcommittee into the question of A.P.I. standard sprocket tooth form, which have proven unsatisfactory, this committee has voted that this specification be stricken off the records as an A.P.I. standard.

The attention of this committee was called to numerous widths of flanges in I-beam sections for chrome block. This matter was referred to the engineering committee.

We received a communication requesting special dimensions on line shafts to fit a special automatic cathead. It was voted to disregard this question of special line shafts.

Wire Rope and Manila Cordage

C. C. Scharpenberg, Chairman Wire Rope Section

Data submitted showed that of lines tested, many passed the present specifications. Nevertheless, many lines are reported to have failed. By the adoption of these specifications as final instead of tentative, it is felt that the percentage of passing lines will be materially increased and the percentage of lines failing to pass will be materially decreased.

Reports were had regarding the successful use of 25-inch by 34-inch grooved rotary drum showing that the line spooled properly at all times and that service of line had been increased. This report showed that the wire lines are properly supported, evenly wound, resulting in less distortion and increased life together with a saving of approximately $50 worth of line each time a new line is put on drum.

Report of rotary wire line duty meter as worked out by the General Petroleum Corp. and the Union Oil Co. of California.

This meter is now in successful operation and will furnish data so that the service rendered can be expressed in ton mile basis and stress and speeds at all times be known.

Report from the engineering and research committee regarding the button test as proposed at a previous meeting. This committee was not able to set the necessary limits and tolerances for applying and interpreting the results.

H. C. O. Clark reporting through H. J. Lowe regarding tentative specifications for well measuring tapes; these will be acted on at a later meeting.

It was not felt that definite standardized specifications could be written on torpedo, power pull, pumping and swabbing lines at the present time due to the lack of standard methods of usage in the different fields.

Several minor changes were adopted to clairify the present specifications.

The rope manufacturers committee submitted a brief with respect to the practice of clamp slippage and resultant damage to drilling lines used for deep hole drilling and strongly urged that some improved method be adopted for feeding drilling line into the hole without forcing the drillers to have recourse to the slipping of rope through the clamps as the present available means for speeding up drilling operations.

It is recommended that the present specifications be adopted as final. Four committees reporting favorable and one committee withholding their approval pending the completion of test now in progress.

The adoption of these specifications as final will have decided effect in making these specifications obligatory and definite, instead of being uncertain and passive also will leave a beneficial effect on any ropes slipped into consigned stocks in the oil fields.

Manila Cordage Section

Due to the few representatives present, only an informal session was held.

These specifications will remain tentative till next meeting.

Pumping Equipment and Engines

T. E. Swigart, Chairman

The committee has taken the following action at the present meeting:

1. Adopted tentative specifications for motor frame dimensions. These will be acted upon finally at the 1928 Colorado Springs meeting. Also has appointed a representative to seek co-operation with National Electrical Manufacturers Association on this subject.

2. Standardized countershafts for belted pumping units.

3. Standardized certain dimensions on reduction gear pumping units.

4. Standardized dimensions and threads in exhaust manifold openings for internal combustion engines for oil field service.

5. Adopted standard rating test form for multicylinder internal combustion engines for oil field service.

6. Reviewed tentative A.P.I. standards No. 11-D on pump parts and adopted this as final specification with slight modifications. Also formulated method of designating fits of plunger pumps for machined working barrels.

7. Standardized forms and dimensions of pull rod ends and couplings.

8. Appointed committee to compile rating test form for electric motors for oil field service.

Steel Tanks for Oil Storage

Ralph J. Reed, Chairman

The committee approved, with a few minor revisions, the general specifications for steel storage tanks issued in mimeograph form as A.P.I. standards No. 12, July, 1927. It also adopted, subject to final engineering check, the details of design for the tanks whose dimensions and capacities are tabulated in these specifications. It now recommends that the specifications be approved by the general committee and submitted to the board of directors for final approval.

The special committee requests the general committee to recommend to the board of directors that it authorize the use of the A.P.I. monogram on tanks with riveted shells built in strict compliance with the A.P.I. general specifications for steel storage tanks and the drawings which will accompany them. At its meeting, the special committee authorized the appointment, by its chairman, of a subcommittee to make recommendations concerning welded tank bottoms; it proposed to proceed with a study of tank accessories and hopes to be able to make some progress in their standardization.

Correlating Committee on Gauges and Gauging Practice

H. W. Fletcher, Chairman

It is reported that the master gauge for sucker rods will be in the manufacturers' hands by February 1, so that the official A.P.I. sucker rods with monogram should be available to the public sometime in early 1928.

On the line pipe specifications the A.E.S.C. stand-off valves were retained on the sizes 2 inch and over. This brings the A.P.I. line pipe gauge specifications in agreement with the A.E.S.C. gauge now in existence, the use of which is authorized in the A.P.I. line pipe specifications.

It was agreed to rewrite the specifications on pipe gauges in simpler form, to be incorporated in the next edition of the specifications.

The revisions in the tolerances on the line pipe gauges, as submitted by the pipe committee, were approved—the principal change being the addition of ½-inch turn tolerance on 11½-inch threads and smaller.

It was also agreed that the physical testing laboratory at Teddington, Eng., be authorized to certify new A.P.I. pipe gauges should it be called upon to do so.

The question of a reduced stand-off on drill pipe, as submitted by the rotary drilling committee was discussed, and a motion was passed to the effect that stand-off valves be changed from 4½-inch to 4-inch threads with the same tolerances as at present. This recommendation of stand-off on drill pipe thread was made for the benefit of the rotary equipment committee and is not made as a decision of the gauging committee.

HIGH TEMPERATURES OF STEEL; SAFETY A FACTOR

(Continued from Page 64)

gether in such a manner that localized stiffening occurs at the joints then intensified stresses may occur adjacent to the joint and cause the pressure container to be weaker than anticipated. If the joint has an efficiency less than 100 per cent the intensification of stresses adjacent to it may be less than that occurring at the joint. If, however, a change of shape occurs near the joint, such for instance as in the small radius of a dished head in which the stiffening action of the joint is added to the stress intensification due to the shape of the head then this condition of stress intensification may cause rupture at a much lower stress than that anticipated.

The above discussion applies in a greater degree when considering thick-walled pressure containers than when considering pressure containers of thin walls of 1 inch or less in thickness, because with thin walls deformations can occur at very much lower average strain values than would be the case in pressure containers with thick walls.

Application of Factors

The question of the application of factors of safety using various materials at

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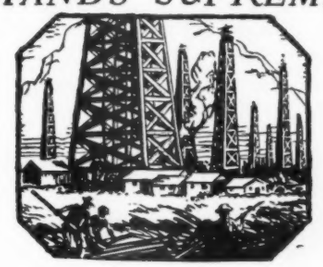

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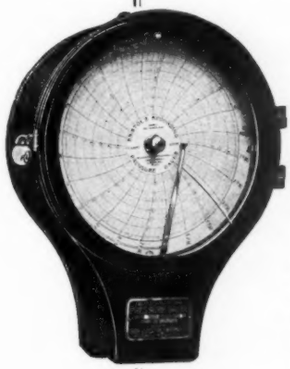

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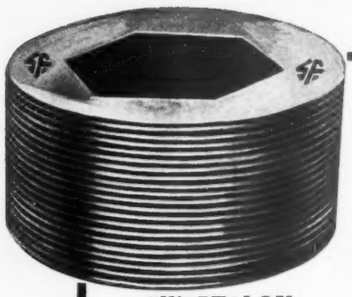

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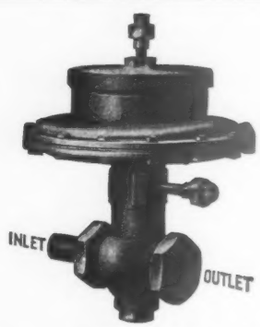

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elevated temperatures also assumes greater importance as the temperatures are increased.

The factor of safety for a .20-.30 per cent carbon steel using an allowable working stress at 900 degrees Fahrenheit of 6,000 pounds per square inch is only 3 in the cylinder and if the openings are not reinforced and heads are not of a special shape to make openings and heads as strong as the cylinder the factor of safety is considerably decreased. For an .08-.12 per cent carbon steel the factor of safety on the above basis would only be 2½.

This paper does not propose to discuss the factor of safety necessary for pressure containers. The value of 3 given above must not be construed to mean that the author advocates this without considering all of the questions of stress intensification involved. The following paragraph, therefore, must be considered in this light.

If by lack of reinforcing of openings, shape of heads, method of joining or kind of material the factor of safety is materially decreased below 3 at any point the margin, when considering thick walls in vessels, becomes inadequate to care for the momentary increases of pressure inherent to the cracking process and to protect against corrosion which occurs in pressure containers. An explanation of the above statement is given in the following paragraph.

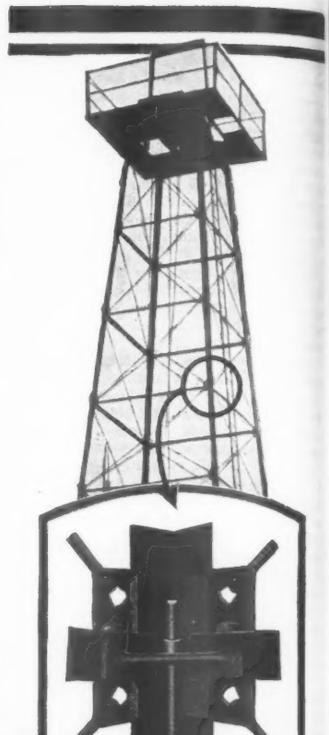
It is the general impression among designing engineers that the strength of steel at elevated temperatures for continuous operation is considerably more than it really is. This is brought about by the fact that the data on which the values are based are obtained from short-time tests rather than those represented by continuous operation. It is not generally known at this time that at elevated temperatures the short-time test values of a steel vary very materially from the long-time test values. Especially is this true when the temperatures considered are above 600 degrees Fahrenheit. At 900 degrees Fahrenheit the short-time strength of low carbon boiler steel, in which the carbon varies from .08 to .12 per cent is 32,500 pounds per square inch, while the long-time strength of this material is 15,000 pounds per square inch. For .20 to .30 per cent carbon steel the values are 35,300 and 18,000 pounds per square inch respectively. The average strengths of these two steels at ordinary temperatures is 49,000 and 59,000 pounds per square inch respectively.

When such values are appropriately applied to the design of pressure containers which are to be used continuously over a long period of time it becomes obvious that the long-time test result is the only safe value to use. At ordinary temperatures the long and short-time test values for steel are practically the same. Whether or not a factor of safety of 3 is sufficient when based on the long-time strength at elevated temperatures with proper reinforcing of openings and proper shape of heads and 100 per cent joint in the metal is very difficult to determine.

For a considerable period pressure containers have been designed for higher temperatures and pressures than that at which they were used. With a desire to gain some of the increased returns from using higher temperatures and pressures certain operators are now using the limit which the original designs called for and in consequence they have had troubles which were not apparent when operating in the original manner. This, it is believed, is largely due to the fact that the true factors of safety in the design have not been ascertained or understood.

Determination of the Value of Design

The general principle used for determining by laboratory methods the value of a design are by no means new, although the method of application described will have some features which may rightfully be termed new. It is well known among engineers that Young's Modulus can be used to determine the stress conditions in a bar without resorting to failure. The value of Young's Modulus for all of the different kinds of



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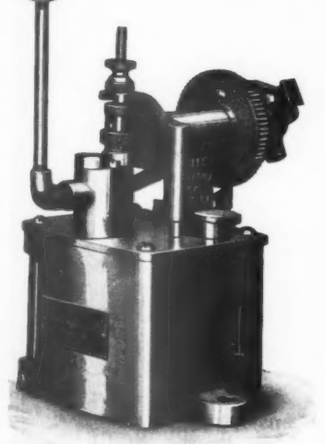

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steel which an engineer uses in quantity fall between the values of 29,000,000 and 31,000,000 pounds per square inch. If, therefore, we use an average value of this modulus and measure the values of strain which occur we can by a correct application of the mathematical theory of elasticity discover the stress conditions at any point in a pressure container within the elastic limit of the steel used in its construction.

In the case of a pressure container with various openings and changes of section and with heads of the usual shape or methods of joining the pressure containers together, which produce points of discontinuity, the application of the mathematical relation of shape and discontinuity to the theory of elasticity is often almost impossible even to the most expert mathematician.

It is believed, however, that the peculiarities associated with steel will do all of the intricate mathematical calculations if properly applied and coupled with the mathematical relations which apply to a simple cylinder.

Pressures and Strains

The ordinary steel used in the construction of pressure containers has a yield point which is very pronounced. Diagrams were made from a pressure container which had a 2-inch wall thickness, a diameter of 6 feet, length of 40 feet and constructed using a dished head bring out the points it was desired to make. These diagrams show the relation between test pressures and strains. The strains were measured by using either a 4-inch or a 2-inch Berry strain gauge over an appropriate gauge length.

There were plotted the relations between test pressures and strains which were obtained at three different points in the pressure container. In the first curve was plotted this relation for the cylinder at a point sufficiently far removed from any discontinuity, due to design or method of fabrication, to test out the simple cylinder formula used, i.e.

$$S = \frac{PD}{2t}$$

in which S = stress in the material, P = the test pressure, D = the diameter of the pressure container, and t = the thickness of the wall.

The pressure in the cylinder at the indicated yield point was 1,740 pounds per square inch. Substituting this value in the above cylinder formula for the vessel tested the yield point value would be 31,300 pounds per square inch. The average test results for the different pieces of steel used in the pressure container showed a yield point value slightly below 32,000 pounds per square inch. It will be seen that the formula is correct because the yield point given by this steel under ordinary tensile tests, is approximately the same value as the yield point found when the pressure is used in the above formula.

The second curve which was for an unreinforced opening showed that the yielding occurred at a pressure approximately 40 per cent below that in the cylinder proper. In the third case which was for the most stressed portion of the head the yielding occurs about 26 per cent below that of the main cylinder when considering that the thickness of the head was one-eighth inch greater than that of the cylinder. The yielding in each case occurred at the same stress in the steel and the conclusion to be drawn is that the intensification factors due to design or shape are as indicated by the ratio between the strain in the main cylinder and that in the dished head or unreinforced section of the vessel. The dished head used is not of the ordinary shape generally used by builders of pressure containers. The ordinary dished head has in general greater stress concentration at the joint between the main radius and the small radius because the small radius is ordinarily much shorter than for that on heads used in the investigation referred to above.

A subsequent test was made on the same pressure container in which the openings were reinforced and on one end an elliptical head of proportions indicated by an appropriate mathematical

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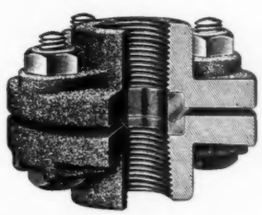

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analysis was introduced. The results obtained show that with adequate reinforcing and an appropriate design of head that the intensification factors due to discontinuity and shape have been eliminated.

What, you may ask, has this to do with the factor of safety? The answer is that it has eliminated a large per cent of the factor of ignorance which has been included in the so-called factor of safety and has made the design more safe, although when calculated by using the ordinary formula this is not apparent.

Corrosion as a Factor in Design

In the operation of oil-cracking stills and pressure container equipment the question of corrosion is an important factor. It is desired to point out here that a safe design for a pressure container must consider this important item and also to say that the corrosion rate of steel under stress is materially different from what it is under no stress. This does not suggest that the ordinary unstressed corrosion specimens placed inside of pressure containers under operating conditions are valueless but it does mean that they are of less value than they would be if the stress situation was made appropriate to that which would be encountered should this metal be used in the construction of a pressure container.

Strength Under Elevated Temperatures

The matter of the strength of metals under elevated temperatures is one of great importance to the oil industry. It is the purpose at this time to indicate the methods used by the laboratory the speaker is associated with and to indicate the reason for adopting these methods of testing.

In a study of methods adopted in other laboratories for testing steel at elevated temperatures two things were apparent which if eliminated would produce more reliable test results than had heretofore been obtained. The first is the need for uniformity, in a considerable section of the specimen, of the temperature at which the metal is to be tested and the other is the elimination of oxidation of the surface of the specimen, which in a very long-time test materially affects the cross section of the piece. If a specimen is relatively small as compared to the thickness of the wall of a pressure container this becomes an important item.

Furnace Construction

In the furnace construction which was adopted, the specimen is immersed in a bath of liquid composed of lead for the temperatures which are above its melting point and another appropriate liquid is used when considering temperatures lower than that of lead. The thermocouple which controls the temperature over a long period of time is immersed in this liquid as well as the specimen. The liquid has the quality of preventing oxidation of the specimen and also of keeping the specimen over the total gauge length at a reasonably uniform temperature.

Certain investigators using ordinary atmosphere in the heating furnace found that the size of specimen had materially affected the results which they had obtained and had stated that the small quarter-inch specimen gave much different results from the half-inch specimen, and therefore was not a reliable specimen to use. This we find is not the case when using the above method, which prevents oxidation, and providing the elongation is taken over 4 diameters in both cases instead of over the same gauge length.

In the design of testing machines great care was taken that the load was axially applied and the lever system was constructed so that all knife edges were in the same plane on any one lever. No cylindrical bearing for the lever system was used. The temperature control used was a Leeds & Northrup recorder controller which was adjusted to very close limits.

The method adopted in producing test results is essentially that first used by H. J. French of the Bureau of Standards and can be described as follows:

Several test specimens were made from each steel. Each successive test speci-

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men was introduced in the testing machine at successively lower loads and the time taken for it to fracture was carefully recorded. The load when once applied to a specimen was never changed. The stresses at which the specimens failed were then plotted against the time of failure and a curve was drawn.

In test results at 900 degrees Fahrenheit on two steels the lower curve showed the value of the long-time ultimate strength for an .08 to .12 per cent carbon steel, the upper curve for a .20 to .30 per cent carbon steel. The test values for 300 hours were the same as those for a longer period.

Tests have been carried out by this method for various steels up to 2,000 hours. It has been demonstrated that the 300-hour value gives the same results at 900 degrees Fahrenheit as if the test were prolonged for a longer period of time. It is assumed, however, that this may not apply when higher temperatures are used.

Summary

The application of factors of safety to pressure containers which are to be used at elevated temperatures should only be done when considering the factors of shape and discontinuity as applied to design and appropriate elevated temperature test results and corrosion test results as applied to the metal used. If a factor of safety of 3 is used in the main cylinder of a thick walled container and large openings are not reinforced causing a 40 per cent stress intensification then the factor of safety at the opening becomes 1.8 and not 3 as is supposed.

It is very clear that all openings in pressure container walls should be reinforced and that the shape of heads for thick-walled pressure containers should be other than the ordinary dished head. The amount of reinforcing necessary is a matter of experiment depending on the fabrication methods used in joining the container together. For a manway opening in which the joint efficiency is 100 per cent the width of reinforcing ring to make this portion of the vessel 100 per cent is a minimum of 40 per cent of the diameter of the opening. This ring should be of the same thickness as the vessel wall. For the heads a shape represented by one-half of an ellipsoid of revolution in which the minor axis is one-half the major axis is the one which causes no greater stress in the head than is found in the most stressed portion of the plain cylinder.

The strength of steel at 900 degrees Fahrenheit which is the maximum temperature at which it is recommended that ordinary carbon steel might appropriately be used for the .08 to .12 per cent carbon steel 15,000 pounds per square inch and for the .20 to .30 per cent carbon steel 18,000 pounds per square inch instead of the higher values generally considered and which are obtained from short-time tests. Above 900 degrees Fahrenheit the strength values of carbon steel under long-time tests fall off very rapidly.

Corrosion results obtained from unstressed specimens in pressure containers do not give the same relative values as those obtained on specimens which are appropriately stressed under the corrosion conditions found on the inside of pressure containers. The stress conditions can be readily obtained by hanging a dead weight on the bottom of a string of specimens.

SOME NEW USES FOR PETROLEUM PRODUCTS

(Continued from Page 146)

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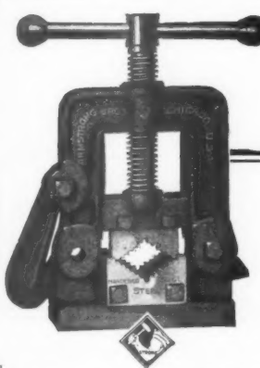

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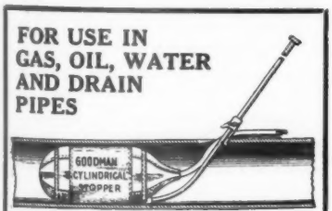

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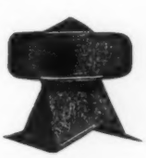

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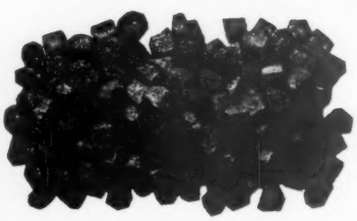
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to the extent that there would be a car for every five or six people in the world. But it is not ridiculous to expect that if the proper work is done in showing the people of foreign countries the benefits the United States has derived from the development of quick transportation the sale of automobiles will be greatly increased in every progressive country of the world.

The number of automobiles outside of the United States is not large but the possibilities for sales are great. Could not a well-defined plan of advertising and education be developed, possibly through some of the departments at Washington, certainly through our foreign agents, through newspapers and otherwise, to promote the greater use of motor cars?

American manufacturers of automobiles are leading in this work at the present time. Several have established manufacturing plants, or assembling plants in different parts of the world. The business of all of these can be helped along by a strong, aggressive educational campaign which possibly might result in a little rivalry between the different countries in motorizing their means of transportation.

The war has brought about the development of large sections of the world that would, in a sense, remind one of the United States 200 years ago. Much money and effort is being used in South America, Africa and the Far East for this purpose. In some cases these countries offer a splendid opportunity for the increased consumption of petroleum products. Here, too, however, it must be said that much of the work done at the present time is in the form of competitive stampede for the little business that does exist instead of a concentrated, well-thought-out effort to get the business by developing it.

Foreign production is increasing at a fairly rapid rate and if the United States is still to have its present export outlet the use of petroleum products the world over must be increased.

Farm Outlet

The farmer of today is an entirely different individual from the farmer of 25 years ago. The telephone, the automobile and the radio have contributed greatly to his comfort and profit, and these benefits must be increased, for as the population of the United States increases the products to feed them must also be increased. Any movement that takes the men from the farm to the city is injury to one and not helping the other.

There are many labor-saving devices that the farmer could become interested in that would reduce his operating costs. Therefore, any general movement to motorize agricultural activities is certain to be of benefit to him.

Miscellaneous Uses

There are many other uses for our products that can be developed into larger markets by a little effort on our part. Among these might be mentioned road building, solubles for the rubber industry, dry cleaning, alcohols, medicinal uses and cosmetics, sprays and disinfectants, oil-burning locomotives and small Diesel engines primarily used away from electric power lines.

Varnish contains approximately 40 per cent of petroleum products while ready mixed products contain about 12 per cent. Up to a few years ago turpentine was almost exclusively used as a paint and varnish thinner. However, it has been found that a petroleum product meets all the requirements of turpentine, at a fraction of the cost and at the present time petroleum paint and varnish thinners have replaced turpentine so that four or five gallons of petroleum products are used to one gallon of turpentine. There still exists a prejudice among a great many painters against petroleum spirits as a paint and varnish thinner and it has been suggested that a way of increasing the consumption of petroleum spirits would be for the oil companies to help remove this prejudice.

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Wewoka, Okla., December 8, 1927

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Oklahoma-Kansas and Eastern Pipe Line Report

OKLAHOMA KANSAS

Pipe Line Statement for October

Runs

	Month	Dy. Av.
*Prairie Pipe Line Co.	4,650,000	150,000
Gulf Pipe Line Co.	1,529,539	49,340
Texas Pipe Line Co.	1,106,724	35,701
Magnolia Petroleum Co.	2,550,386	82,271
Empire Pipe Line Co.	1,473,318	47,526
Cosden Pipe Line Co.	1,138,647	36,731
Sinclair Pipe Line Co.	2,986,633	96,343
Oklahoma Pipe Line Co.	3,893,416	125,594
Other lines	8,401,000	271,000
Total October	27,729,663	894,506
Total September	27,436,777	914,558
Difference	292,886	20,052

Shipments

†Prairie Pipe Line Co.	5,156,292	166,332
Gulf Pipe Line Co.	1,201,667	38,763
Texas Pipe Line Co.	1,037,348	33,463
Magnolia Petroleum Co.	1,818,509	58,671
Empire Pipe Line Co.	1,661,078	59,357
Cosden Pipe Line Co.	1,020,709	32,926
†Sinclair Pipe Line Co.	2,743,407	88,497
Oklahoma P. L. Co.	3,838,711	123,829
Other lines	7,750,000	250,000
Total October	26,128,011	842,838
Total September	25,406,211	846,874
Difference	721,800	4,036

Stocks

*Prairie Oil & Gas Co.	30,800,000
*Prairie Pipe Line Co.	2,000,000
Gulf Pipe Line and Gypsy Oil Co.	9,850,890
The Texas Company	5,131,914
Magnolia Petroleum Co.	6,753,353
Empire Pipe Line Co.	4,482,898
Cosden Pipe Line Co.	3,328,315
*Sinclair Crude Oil Pur. Co.	20,250,000
Carter Oil Co.	16,103,950
Oklahoma P. L. Co.	2,717,330
*Other lines	10,000,000
Total October	111,418,650
Total September	109,566,085
Difference	1,852,565

*Estimated. †Prairie Pipe Line shipments include Texas crude and Sinclair Pipe Line shipments include Wyoming, Texas crude.

Note: Stocks do not include approximately 5,200,000 bbls. of crude oil held in storage on private tank farms and leases and approximately 1,800,000 bbls. of Texas Panhandle crude in storage in Oklahoma and Kansas.

EASTERN PIPE LINES

Runs From Wells

In the following table will be found the regular receipts from wells by various pipe lines in New York, Pennsylvania, West Virginia, Ohio, Kentucky and Indiana for August and September:

	Aug. '27	Sept. '27
National Transit	146,479.36	148,770.19
S. W. Pa. P. L.	86,548.23	85,669.19
Eureka P. L.	395,237.23	386,201.76
Buckeye P. L. (Macksburg)	142,331.35	124,616.49
Buckeye P. L. (Cleveland)	11,953.23	11,420.57
Buckeye P. L. (Lima, etc.)	129,337.26	124,867.84
Indiana P. L.	8,905.59	9,150.58
Cumberland P. L.	267,515.04	245,038.71
N. Y. Transit	25,028.15	22,882.06
Tidewater P. L.	197,502.70	188,881.97
Pure Oil	164,866.70	159,336.57
Emery P. L.	59,569.14	57,479.57
Paragon Dev.	30,553.65	34,062.15
Pittsburgh P. L.	4,824.41	4,956.74
Stoll Oil Ref.	15,831.15	15,215.87
Total	1,886,983.19	1,808,560.89
Daily average	60,870.42	60,285.39

Note—Indian Refining Co. also reported other receipts of 375,293.92 bbls. Paragon Refining Co. had other receipts of 202,741.28 bbls. Paragon Development had other receipts of 24,753.46 bbls.

Petroleum Deliveries

The following tables exhibit the shipments or regular diliveries of various pipe lines in New York, Pennsylvania, West Virginia, Ohio, Kentucky and Indiana for August and September:

	Aug. '27	Sept. '27
National Transit	344,799.73	352,363.94
S. W. Pa. P. L.	343,310.98	352,236.47
Eureka P. L.	198,756.14	181,601.67
Buckeye P. L. (Macksburg)	153,543.57	144,078.47
Buckeye P. L. (Cleveland)	727.43	971.43
Buckeye P. L. (Lima, etc.)	748,093.86	861,075.42
Indiana P. L.	868,709.30	840,001.40
Cumberland P. L.	150,233.42	141,790.84
N. Y. Transit	289,844.19	316,049.51
Northern P. L.	196,331.58	188,878.47
Tidewater P. L.	150,113.65	133,684.94
Pure Oil	205,913.45	176,414.97
Emery P. L.	54,557.91	59,423.76
Paragon Ref.	177,675.03	202,284.12
Indian Ref.	879,066.53	843,722.80
Paragon Dev.	31,192.30	26,388.83
Pittsburgh P. L.	5,295.27	5,410.12
Total	4,298,243.43	4,326,377.16
Daily average	138,653.01	144,312.57

Gross Stocks

The gross stocks held by various pipe lines in the oil producing sections of New York, Pennsylvania, West Virginia, Ohio, Indiana and Kentucky at the close of August and September:

	Aug. '27	Sept. '27
National Transit	1,129,180.77	1,154,732.90
S. W. Pa. P. L.	683,536.32	648,789.30
Eureka P. L.	1,949,985.99	1,803,065.25
Buckeye P. L. (Macksburg)	416,688.27	421,560.39
Buckeye P. L. (Cleveland)	39,918.88	50,809.14
Buckeye P. L. (Lima, etc.)	4,668,115.54	4,829,631.04
Indiana P. L.	620,873.23	621,233.99
Cumberland P. L.	591,843.81	614,472.24
Southern P. L.	429,471.58	466,091.05
N. Y. Transit	460,922.97	507,169.10
Northern P. L.	470,103.63	534,035.12
Pure Oil	395,429.71	400,850.33
Emery P. L.	13,506.50	12,401.24
Paragon Ref.	15,696.20	15,860.76
Indian Ref.	93,156.64	122,910.52
Paragon Dev.	6,821.39	6,145.06
Pittsburgh P. L.	3,864.26	2,978.00
Total	11,989,115.18	12,212,716.43
Increase	535,987.21	223,601.25

Grades of Oil

The following table shows the amount of the different grades of oil held by the eastern pipe lines at the close of August and September, showing the gross stocks of the above fields:

	Aug. '27	Sept. '27
Pennsylvania	4,238,474.19	4,235,065.02
Lima	1,018,062.71	1,078,066.53
Kentucky	1,134,629.10	1,144,347.98
Mid-Continent	5,631,954.28	5,691,414.41
Illinois	65,894.90	63,822.51
Total	11,989,115.18	12,212,716.43

Daily Average Runs

The following table shows the daily average runs of the Pennsylvania, Lima and Kentucky oil fields for the past four years:

	1924	1925	1926	1927
Jan.	62,538	56,831	55,630	56,209
Feb.	68,023	60,606	60,394	61,298
Mar.	68,721	60,576	61,644	63,247
April	71,058	63,062	63,019	60,337
May	63,942	59,217	60,580	60,284
June	63,230	61,270	64,121	62,757
July	64,208	62,639	63,206	58,574
Aug.	59,942	59,686	64,815	60,870
Sept.	62,930	62,510	64,639	60,285
Oct.	64,976	60,995	62,704	.....
Nov.	56,282	59,350	61,774	.....
Dec.	55,814	57,974	58,755	.....

Daily Average Shipments

The following table gives daily average shipments from the Pennsylvania, Lima and other fields for the past four years:

	1924	1925	1926	1927
Jan.	145,518	157,889	156,056	141,227
Feb.	148,732	160,863	159,488	138,534
Mar.	147,098	154,591	150,239	133,777
April	147,611	151,429	152,371	140,227
May	134,997	146,995	160,998	144,894
June	143,010	149,467	160,257	149,772
July	124,187	151,338	160,945	151,350
Aug.	123,120	151,730	151,929	138,653
Sept.	127,325	156,719	158,915	144,213
Oct.	123,170	145,388	151,132	.....
Nov.	124,400	143,582	152,668	.....
Dec.	151,392	150,162	136,428	.....

Gross Stocks

In the following table will be found the gross stocks of the various lines of the Pennsylvania, Lima and Kentucky oil fields, including oil received from other lines at the close of each month for the past three years:

	1925	1926	1927
Jan.	11,353,276	9,959,170	9,718,901
Feb.	11,192,924	9,579,354	10,119,163
Mar.	11,158,297	9,438,293	10,794,044
April	11,062,082	9,805,851	11,112,396
May	11,207,562	9,531,757	11,359,381
June	11,093,796	9,585,904	11,493,472
July	11,067,453	9,734,687	11,453,128
Aug.	10,974,481	9,668,947	11,989,115
Sept.	10,781,753	9,433,732	12,212,716
Oct.	11,086,850	9,269,806	.....
Nov.	11,068,158	9,257,667	.....
Dec.	10,458,445	9,454,513	.....

Franklin Pipe Line Co.

The following table exhibits the condition of the Franklin Pipe Line at the close of business for the months named and not counted in the stocks and averages reported above.

	Runs	Shipments	Stocks
1926—			
Sept.	2,788.18	3,373.06	13,985.81
Oct.	2,991.86	2,307.75	14,671.28
Nov.	2,810.60	1,664.55	15,817.31
Dec.	2,847.52	5,661.11	13,103.72
1927—			
Jan.	2,641.54	1,470.43	14,274.84
Feb.	2,764.30	1,082.82	15,956.32
Mar.	2,587.20	1,878.56	16,664.96
April	2,834.23	1,512.65	17,986.54
May	2,768.47	539.29	20,215.72
June	2,946.29	664.40	22,497.61
July	3,153.39	1,276.61	24,374.39
Aug.	3,057.89	3,713.11	18,719.17
Sept.	3,309.56	2,656.48	19,372.26

The Illinois Field

The following table gives the report of the Illinois Pipe Line Co. in Illinois:

Gross stocks, October 1	2,063,018.96
Other receipts	343,655.75
Runs from wells	591,009.13
Regular deliveries	405,432.70
Other deliveries	483,089.11

The amount of Illinois oil run by the Tidewater Pipe Co. in September was 28,580.36 bbls. and deliveries were 27,779.79 bbls. Adding these figures to those of the Illinois Pipe Line Co. makes the runs and deliveries as follows:

	Runs	Deliveries
1926—		
September	688,798.66	516,082.05
October	681,648.96	531,467.39
November	651,263.33	498,425.37
December	668,909.58	587,947.61
1927—		
January	621,421.03	530,685.94
February	595,831.16	474,950.71
March	727,593.91	554,947.43
April	593,225.97	444,818.49
May	728,759.40	543,193.02
June	640,975.85	532,217.78
July	613,901.30	484,902.58
August	651,276.40	529,331.87
September	619,589.49	433,212.49

Tidewater Pipe Co., Ltd., also delivered in September 218,229.09 bbls. of Oklahoma oil.

AVERAGE DAILY RECEIPTS OF CALIFORNIA OIL AT ATLANTIC AND GULF COAST PORTS

Average bbls. per day—	ATLANTIC PORTS						GULF COAST PORTS						Total All Ports
	Baltimore	Boston	New York	Philadelphia	Others	Total	Galveston	New Orleans Baton Rouge	Port Arthur Sabine Pass	Tampa	Total		
June	26,667	11,233	48,533	17,267	17,267	120,967	.....	.....	.....	.....	.....		120,967
July	13,484	17,290	33,065	9,129	6,451	78,419	.....	.....	.....	.....	968		79,387
August	18,516	3,065	48,129	17,323	26,000	113,033	.....	.....	.....	.....	.....		113,033
September	23,033	6,967	51,400	14,567	19,533	115,500	.....	.....	.....	.....	.....		115,500
October	20,936	4,355	47,968	14,129	14,387	101,774	.....	.....	.....	.....	.....		101,774

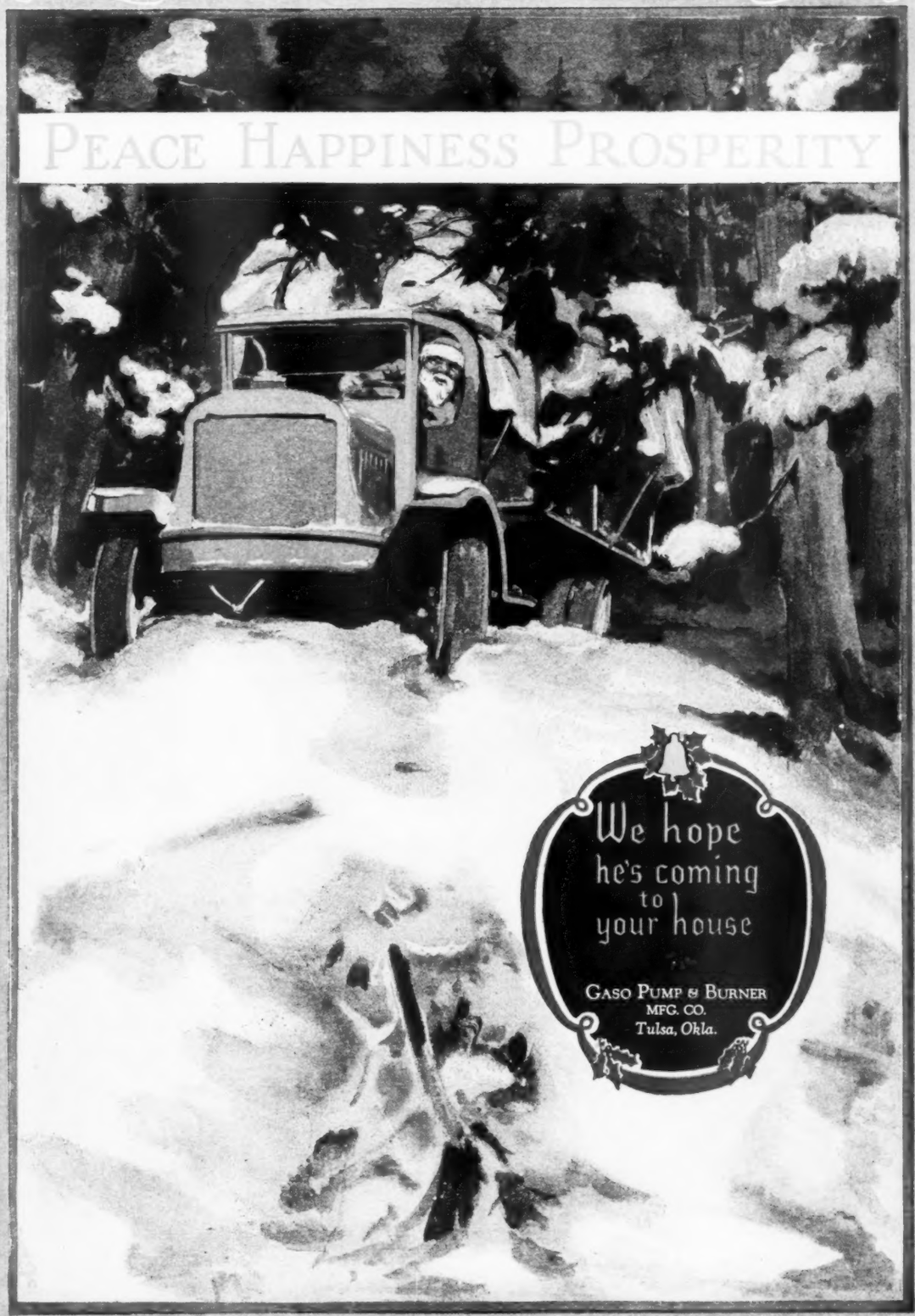
AVERAGE DAILY IMPORTS OF PETROLEUM AT PRINCIPAL UNITED STATES PORTS

Average bbls. per day—	ATLANTIC PORTS						GULF COAST PORTS						Total All Ports
	Baltimore	Boston	New York	Philadelphia	Others	Total	Galveston	New Orleans Baton Rouge	Port Arthur Sabine Pass	Tampa	Total		
June	18,167	9,700	83,867	10,900	16,567	139,200	2,000	31,800	.....	.....	33,800		173,000
July	22,226	10,387	80,193	7,193	28,710	158,710	3,226	25,065	806	.....	29,096		187,806
August	19,323	9,032	80,903	14,258	31,821	155,387	2,097	21,161	.....	.....	23,258		178,645
September	28,033	11,433	85,500	12,800	37,700	175,467	5,667	19,233	.....	1,600	28,500		203,967
October	26,064	13,097	79,355	3,838	34,097	156,451	1,613	19,323	806	1,871	23,613		180,064

GROSS PRODUCTION OF THE UNITED STATES FOR 12 MONTHS

(IN BARRELS)

		California	Oklahoma	Texas	Kansas	Arkansas	Louisiana	Rocky Mountains	Eastern Fields	Total
1926—										
November:	Month	19,173,128	16,876,950	18,593,160	3,593,490	4,299,480	2,054,911	2,842,587	3,216,000	70,649,706
	Daily average	639,104	562,565	619,772	119,783	143,316	68,497	94,752	107,200	2,354,990
December:	Month	20,276,950	17,382,908	19,753,591	3,654,156	4,266,189	2,018,734	2,658,301	3,313,000	73,323,829
	Daily average	654,095	576,868	637,212	117,876	137,619	65,120	85,752	106,871	2,381,414
1927—										
January:	Month	20,184,872	19,035,426	18,605,363	3,769,879	4,476,469	1,905,570	2,620,303	3,332,508	73,530,383
	Daily average	651,125	614,046	600,173	121,609	131,499	61,470	84,203	107,500	2,371,948
February	Month	17,982,711	19,752,348	16,483,712	3,352,076	3,574,256	1,784,104	2,385,135	3,007,200	68,321,542
	Daily average	642,240	705,441	588,704	119,717	127,652	63,718	85,183	107,400	2,440,057
March:	Month	19,835,724	22,480,921	18,232,617	3,675,143	3,853,920	2,032,982	2,476,798	3,325,800	75,923,905
	Daily average	639,862	725,191	588,149	118,553	124,320	65,580	79,574	105,100	2,449,158
April:	Month	19,492,825	22,208,130	17,801,140	3,516,930	3,378,240	1,994,330	2,615,770	3,474,000	74,483,365
	Daily average	648,870	740,271	593,371	117,231	112,608	66,491	87,192	115,800	2,482,745
May:	Month	19,506,054	23,258,463	19,539,083	3,704,314	3,493,669	1,935,175	2,742,588	3,467,000	77,646,346
	Daily average	629,238	750,273	630,293	119,494	112,699	62,425	88,471	111,839	2,504,721
June:	Month	19,181,442	22,330,330	18,299,810	3,437,580	3,365,760	1,880,820	2,592,437	3,330,000	76,018,179
	Daily average	639,381	761,011	613,327	114,586	112,192	62,694	86,414	111,000	2,500,606
July:	Month	19,319,021	26,522,546	17,607,194	3,454,052	3,406,683	2,279,405	2,635,607	3,373,000	78,597,528
	Daily average	623,194	855,566	567,974	111,422	109,893	73,529	85,020	108,806	2,535,401
August:	Month	19,279,131	26,283,350	17,715,229	3,424,570	3,242,600	2,199,905	2,530,065	3,608,400	78,283,250
	Daily average	621,907	847,850	571,459	110,470	104,600	70,964	81,615	116,400	2,525,266
September:	Month	19,064,500	24,111,660	18,322,800	3,342,240	3,022,970	2,027,070	2,238,609	3,465,000	75,604,849
	Daily average	635,483	803,722	610,760	111,408	101,099	67,569	74,620	115,500	2,516,828
October:	Month	19,448,893	24,223,803	19,203,136	3,509,169	3,117,300	3,056,159	2,270,905	3,565,000	77,394,365
	Daily average	627,384	781,413	619,456	113,199	100,555	66,339	73,255	115,000	2,496,601
Total 12 months		233,746,351	265,467,435	220,256,815	43,433,629	43,107,536	24,169,165	30,699,005	40,486,500	899,376,336


PEACE HAPPINESS PROSPERITY
We hope
he's coming
to
your house
GASO PUMP & BURNER
MFG. CO.
Tulsa, Okla.

Not even a Clark "Super 2" could compress our good wishes for our Oil Industry friends into the small space the artist has left us here. We'll have to ask you to call on your imagination to picture the wealth of good things we wish for you this Christmas and through 1928.

Clark Bros. Company